# American Aviation

MAY 1, 1950 25c

THE AIR INDUSTRY'S PIONEER INDEPENDENT MAGAZINE


## CAA and CAB Take the Lead

SOMEBODY has estimated that there are about 200 aviation meetings a year. This figure may be disputed as being too high or too low but no one will argue the point that aviation has become the meetin'st group of people in the United States.

So CAA Administrator Del Rentzel and CAB Chairman Joseph J. O'Connell, Jr., have invited representatives of 15 aviation organizations to Oklahoma City on May 2 and 3 to a preliminary planning meeting "to explore the possibility of establishing a common program for winning wider public acceptance and use of aviation." If plans work out, they say, a full-scale conference will be organized for a later date "under proper auspices" and all aviation organizations will be invited to hold their annual meetings simultaneously with this conference.

by W. W. P.

Since this May 2-3 meeting is actually an outgrowth of a suggestion passed on by this writer to the Oklahoma City Chamber of Commerce last fall, following a suggestion made by Louis Inwood, director of aviation for Kansas City that something be done to cut down the number of aviation meetings and conferences, a few pertinent comments would seem to be in order.

The proposal which Mr. Inwood made and which this column passed on to the air-minded Oklahoma City Chamber of Commerce was quite simple and practical. It was merely to endeavor to bring to one city in one week of 1951 (since 1950 convention plans were already too far advanced), a half-dozen or so annual meetings of aviation organizations having certain overlapping interests. Each organization would have its own programs, as usual, but there could be *a few* joint sessions or banquets at which common aviation problems could be discussed or keynoted.

The Oklahoma City Chamber reached for the ball with typical enthusiasm but the Rentzel-O'Connell letter announcing the plans might indicate that the Chamber or some one is running the wrong way with the ball. If the true purpose of the proposed conference is to explore the possibility "of establishing a common program for winning wider public acceptance and use of aviation," then the trend would seem to be toward another "clinic" type of conference in which a lot of aviation people sell aviation to each other under the false idea that they are selling avia-

(*Turn to page* 8)

**New President of Airport Executives**

Melvin H. Nuss, manager of the Reading, Penna., Municipal Airport, who was elected president of the American Association of Airport Executives at its annual meeting in Columbus, O. April 16-20. Mr. Nuss, long one of the best known airport managers in the U. S., was formerly secretary-treasurer of AAAE. (See story page 11).

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# BACKGROUND & TRENDS

## Jets May Change the Picture

Jet transports may change the organizational set-ups of the larger airlines. Greater speed will shrink the airline map and no point on a domestic system would be over three hours from a central point on the system, says Hal Nourse, vice president-economic controls of United Air Lines. He sees a beneficial effect on overhead costs through elimination of regional operations and, therefore, duplicate administrative or overhead staffs, office facilities, and all costs, dependent upon organization size. Centralized administration in air transport is generally the most economical, he notes, also pointing to the possibility that simplicity of design and operation may make for less station service payroll and expense.

## More Extra Fares Out

Trend toward elimination of extra fares continues. Eastern and National will drop the 10% extra charge for Constellations and DC-6's some time this month. Only two carriers will then have the surcharge: Braniff and Delta.

## Turbo-Prop C-124?

Air Force may decide soon whether to give Douglas Aircraft Co. the go-ahead on a propeller-turbine version of the C-124 heavy all-purpose transport. Allison XT-40's, which now develop 5,500 hp, are being considered for the plane, which is now powered by four Pratt & Whitney R-4360's, developing 3,500 hp. Take-off gross weight can be upped from 175,000 to 200,000 lbs. with the Allisons, and payloads would be over 75,000 lbs. as against 50,000 lbs. for the piston-powered version.

## Prototype Legislation

The proposed prototype aircraft bill still hadn't been cleared by the Budget Bureau at presstime, but observers seemed confident that an okay would be forthcoming. However, they've worried about the time element as far as Congress is concerned—afraid it will get lost in the rush. Bill provides expenditure of $12.5 million over five years for testing (not design and construction) of prototypes.

## North American Plans Ahead

Although it won't happen tomorrow, or 10 years from now, the piloted airplane is definitely on the way out as a final military weapon, and North American Aviation is working on "new, forward steps to this fighting business." So said J. H. "Dutch" Kindelberger, board chairman and chief executive officer, recently. Complexity of modern planes and problems of air warfare are getting beyond the human pilot's limits; the next step is to give the pilot electronic aids, and the step after that is to leave him on the ground, he said, adding that when that day comes, North American "will provide the services with the necessary weapons." He added a warning: the manpower story in the next emergency is going to be different. New style planes call for more skill and "you can't give a girl a tight brassiere and a rivet gun and put her to work any more."

## Traffic and Finance

Airline traffic up, rail and bus down, is the present trend. Airline passenger loads are heavy and freight is increasing substantially. All first-quarter reports aren't in, but in the first two months of the year domestic passengers and passenger-miles were 10-12% ahead of the same 1949 period. In the same months, rail passenger-miles were down 18% (the coal strike had some effect), while bus dropped 6% to 7%. Airlines' first quarter should be satisfactorily ahead of 1949. American's results, of course, were adversely affected by the 11-day strike of maintenance employes in March. Only a few first-quarter financial reports are available. United lost about half a million less than last year, when it was $3.3 million in the red. American, because of the strike, lost considerably more—$1,431,285 against $222,522. Western broke even against a $128,529 loss last year, while Capital lost $152,000 against $499,000. Internationally, it's a big travel year, but airlines are afraid reports of capacity loads will drive business away. Some of them are making it clear to the public that seats are available.

## Post Office Dept.

Less U. S. mail will be carried by Scandinavian Airlines System this year. SAS was paid about $600,000 for carrying U. S. mail in 1949 against the $200,000 paid to American Overseas Airlines by the Scandinavian countries for transporting their mail westbound. PO will put more U. S. mail on AOA, try to get SAS down to $400,000. SAS will still get more U. S. mail than AOA because it has more schedules . . . Paul Aiken, who leaves his post as Assistant Postmaster General this month to seek the Democratic Senatorial nomination in Kansas, faces a tough fight. Even if he wins the primary, Kansas is traditionally Republican and the odds are against him . . . Some foreign countries will try to obtain a reduction of the Universal Postal Union rate of $2.86 a ton-mile for carriage of international air mail at a UPU committee meeting in Switzerland this month. They claim a lower UPU rate would permit lower postage rates and develop greater air mail volume. U. S. Post Office, IATA, and U. S. international airlines oppose a change, however.

## Jones Turns to the Technical Side

CAB Member Harold Jones will spend a major part of his time from now on in studies of the technical and operational problems of airlines, with emphasis on their economic aspects and significance. At present he's on a round-the-world trip studying the "operational soft spots" of U. S. international airlines in the Orient and Europe. He'll also visit maintenance bases, confer with government officials and fly in British jets and turboprops.

## Among the Airlines

First 10 days' operation of American's transcontinental DC-6 coach service showed an 86.4% load factor, with 1,630 passengers carried. AA notes that when it was using 70-place DC-4's, load factor was below 50%. About half of the 1,630 passengers on the 70-place DC-6's traveled coast-to-coast, one-fourth New York-Chicago and one-fourth Chicago-Los Angeles . . . United Air Lines is said to have no present plans to replace its DC-3's. About 80% of the company's seat-miles are now with DC-6's . . . United, incidentally, would look favorably on purchase of four turbo-prop engines for use on an experimental cargo plane, but such engines probably won't be in quantity production for at least two years, says W. A. Patterson, UAL president . . . Campaign to stop alleged fraudulent practices of certain ticket agencies in booking and sale of non-scheduled airline accommodations has spread to New York, where the Better Business Bureau is organizing a program to combat such practices.

Grumman

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# News in Brief

**EAL Orders More Connies:** Eastern Air Lines has ordered 10 new Lockheed L-1049 Constellations at cost of $18,000,000, including spare parts and engines, and hopes to have the new planes in service by fall of 1951. Capt. Eddie Rickenbacker, EAL president, disclosed plans to equip the craft with turbo-prop engines later, "maybe by the end of 1954, certainly not later than 1955." Plans call for installation at that time of an improved Allison T-38, which will develop 3,500 hp, compared with present rating of 2,750 hp. The L-1049's initially will be powered by four Wright R-3350-CA-1 engines rated at 2,750 hp each, an increase of 1,000 hp per plane over latest model Constellations in service. Cruising speed is listed by EAL as 330 mph.

**Shemya Policy Reversed:** The Civil Aeronautics Board indicated it would support the appropriation and use of funds needed to maintain ground facilities at the Aleutian Islands air base at Shemya. Reversing a position taken in March when it said continuance of the Shemya base could not be justified from a financial standpoint, following withdrawal of the Air Force, CAB said that "affirmative advantages" now recognized yb the Defense Establishment and revised cost estimates justify the necessary expenditure.

**Deficient Plane Budget:** Military aircraft procurement apropriations allocated under the President's 1951 budget are inadequate to hold the Air Force's 48-group level and maintain Naval aviation's present level, the Joint Chiefs of Staff have advised Defense Secretary Louis Johnson. JCS is believed to have informed Johnson that about $583,000,000 additional appropriations are required to keep the air services modern. Rep. Carl Vinson (D., Ga.) has proposed that the AF get $200,000,000 more, Naval aviation $383,000,000. Some budget increase is expected, with or without Johnson's support.

**AF Leadership:** While Thomas K. Finletter, former chairman of the President's Air Policy Commission, has been unanimously confirmed as Secretary of the Air Force to succeed W. Stuart Symington, there seems little likelihood that John A. McCone, another member of the commission, will become AF Undersecretary. McCone's election as a director of Curtiss-Wright Corp. at the April 20 annual meeting lends support to reports that he would turn down the AF post, since custom dictates that the Secretarial officials have no corporate interests.

**Monarch-Arizona Merger:** Acquisition of Arizona Airways by Monarch Air Lines has been tentatively approved by CAB. The decision becomes final upon a showing by Monarch of its financial ability to inaugurate and maintain service over the consolidated routes. The action will complete a merger of three feederlines—Challenger, Monarch, and Arizona—with combined routes extending from Billings, Mont., in the north, to Douglas, Ariz., and El Paso, Tex., in the south.

**Feeder Seminar:** A national seminar on feeder airlines will be held May 25-26 at the Extension Study Center of the University of Oklahoma, Norman, Okla., with CAB Member Josh Lee as a principal speaker.

**Parks Route Split-Up?** Mid-Continent Airlines, Turner Airlines, and Ozark Air Lines have been recommended by CAB Examiner Ralph L. Wiser to operate the inactive feederline routes originally awarded to Parks Air Lines. Wiser said these three lines are best fitted of all applicants to establish the midwest area service in a minimum of time, and urged that temporary three-year certificates be issued to each.


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# EDITORIAL

(CONTINUED FROM PAGE 7)

tion to the public. The day of trying to sell aviation to the public through aviation conferences is over, in this column's opinion, and healthy growth in the future rests on letting the numerous *trade* organizations meet and discuss *trade* problems. Aviation is now a *business* or rather a *series of businesses* and failure to recognize this solemn fact will result in merely more chatter about generalities.

### Some Groups Overlap

Messrs. Rentzel and O'Connell, with the very best of constructive intentions, have invited representatives of everything from the Airfreight Association and the airline pilots and the flying farmers to the U. S. Conference of Mayors, the Aircraft Industries Association and the aviation committee of the Petroleum Industries Committee, to sit around for two days to plan another big over-all conference which can only resolve, in the final analysis, that aviation is a great thing and needs to be advanced. The interests of the groups invited are much too diverse to achieve anything but generalized results.

Maybe this in itself is a good thing, but a more realistic down-to-earth approach would seem to us to make more sense. For example there is considerable common bond among the American Association of Airport Executives, the Airport Operators Council, the NATA, the AOPA, the Flying Farmers, the NAA and the National Association of State Aviation Officials. If all these groups met in the same city during the same week, with a few joint sessions, much might be accomplished. But why try to mix in with these groups the annual meetings of the big aircraft manufacturers, the airlines, the airline pilots and the Airfreight Association?

It is too much to expect to try to tie in all aviation organizations into one program, in our opinion. Since the war aviation has become a series of separate industries and specialized interests. If various *areas of interests* can be brought together informally, much could be gained, as long as it is realized that these groups are *trade* groups concerned with some one *business* of aviation.

### Two Examples

Here is what we mean. A few weeks ago the ATA engineering and maintenance conference was held at Kansas City. It was one of the best business-like conferences of the year with airline men and manufacturers discussing concrete problems. Two weeks later the SAE had a good aeronautic meeting and aircraft display in New York. The ATA, the Institute of the Aeronautical Sciences and the SAE could do well to hold some of their annual technical meetings in the same city in the same week. Certainly the manufacturers who go to considerable expense to display their wares would appreciate reaching more people at one time.

During the past two weeks in two different cities in Ohio were two big airport meetings. Both had excellent programs. Both had many common problems. Both groups should meet in the same city during the same week, one starting on Monday, the other on Wednesday or Thursday, with a joint session or two to hear government officials and others who have had to skip one convention or undertake the cost of traveling to two conventions. One convention had 48 exhibits, the other 18. Yet all of the manufacturers want to reach both groups with their displays.

It seems to us that Del Rentzel, who is the best Administrator the CAA has ever had, has already accomplished a great deal with his airports and civil development advisory committees. The only step that remains is to have those advisory committees meet at the time of other similar meetings—a consolidation of efforts to save travel cost and time. The NATA, ADMA and NASAO could well fit into some of these gatherings, not to combine sessions, but to meet either concurrently or successively.

### Healthy Approach

If there is to be another over-all aviation conference or "clinic," let it be held in Washington and put the five members of the CAB and the Administrator and his department heads on the speaker's platform to answer questions from the floor. A very large percentage of aviation's multitude of problems stem from or lead to the government agencies in Washington. No conference can possibly draw up a "common program" to "sell" aviation to the public without knowing, first, what the government policy on civil aviation happens to be.

Far from pouring cold water on the forthcoming Oklahoma City conference, we wish it well. Something important can come out of it if a realistic approach is taken and if another organization isn't founded and if another general talk-talk meeting isn't the sole result. Aviation's organizations today are interested in basic problems of cost, procedures, revenues and other facets of *business*. Find the practical ways to make the airplane pay off economically, and the public won't have to be "sold."

WAYNE W. PARRISH

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## Ten Years of Military Aviation Progress

Sometimes we forget how fast things are moving in the field of military aviation. Speaking before The Aero Club of Washington recently, Capt. Leonidas D. Coates, deputy director of the Piloted Aircraft Division of the Bureau of Aeronautics, recalled Naval aviation standards ten short years ago:

"Only ten years ago Naval Aviation made the transition from biplanes to monoplanes. The standard carrier-based fighter that was withdrawn from fleet service in that year was a 4,000-pound biplane with fabric covered wings and without flaps. Its top speed was 231 mph. Its landing gear was retracted manually; it had no armor or bullet-sealing fuel cells; and its armament consisted of one .30 or .50 caliber gun with a fixed telescopic sight. Oxygen for high altitude flying was a fairly new idea then, and it was supplied to the pilot through a long rubber tube ending in a curved pipe stem which the pilot gripped in his teeth. Flying above 23,000 feet with this oxygen equipment was prohibited."

*With airplane-like controls, operator in tail of B-29 tanker "flies" telescoping gasoline boom into slot on nose of B-50 receiver plane.*

# Gas station in the sky!

The idea of flying gas stations was a popular joke during aviation's early days. Today, it is a reality which Boeing, in co-operation with the U. S. Air Force, has brought to a high state of development with the "flying boom" for refueling airplanes in flight.

Proved practical in actual test flights, the Boeing boom greatly extends the range of bombers such as the great new Boeing B-50 Superfortress. It makes possible fast, safe refueling of planes at high altitudes, over the weather and out of range of interceptors.

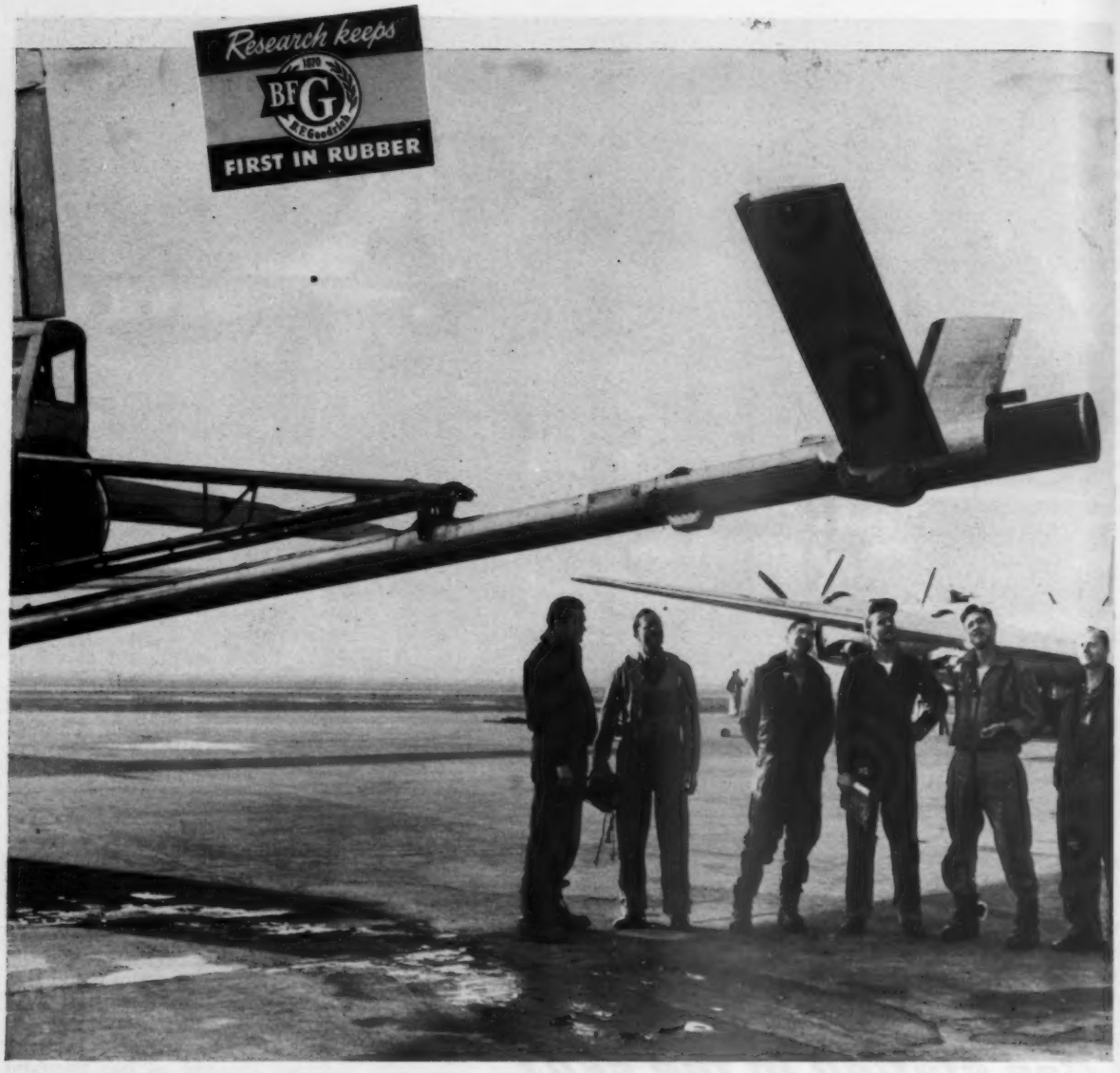
Details are still secret. But the Boeing boom is far advanced over the method used to refuel the Air Force Superfortress "Lucky Lady II" when it flew non-stop around the world last year.

The job of designing and manufacturing a successful refueling device was tackled with characteristic Boeing thoroughness. Designers, engineers and mechanics worked night and day as a well-coordinated team, compressing years of painstaking effort into months.

They dedicated to the task the same imagination in design and engineering, the same production skills and capacities that go into all Boeing products. "Built by Boeing it's bound to lead."

***Built by Boeing for the U. S. Air Force are the new B-47 Stratojet bombers, B-50 Superfortresses and C-97 Stratofreighters; for the Army, the L-15 Scout liaison planes; and for five of the world's leading airlines, the twin-deck Boeing Stratocruisers.***

**BOEING**




# The pipe that flies like a plane

THE strange-looking device on the tail of this plane is the Flying Boom. It's a new telescoping pipe for inflight refueling, developed by Boeing.

The vee-shaped vanes on this pipe—called "ruddevators"—are airplane-like controls used to actually *fly* the pipe into position for refueling. And like the control surfaces of a plane, these ruddevators have to be accurate at any altitude, in any weather. Which means, of course, they have to be protected against ice.

Looking for the best answer to the icing problem, Boeing turned to B. F. Goodrich. BFG engineers recommended electric rubber—a B. F. Goodrich development that is the most efficient method of supplying spot, anti-icing heat.

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American Aviation

VOLUME 13 NO. 23

# 'Operation Cooperation'

## . . . airport, airline, government leaders practice harmony at AAAE's largest convention

HIGHLIGHT OF AAAE's 22nd Annual Meeting was the airport-airline forum featuring five airline representatives and five airport representatives, whose views on timely topics were in agreement as often as not. There were sparks of hilarity as demonstrated on the left by George H. Clay, secretary of Trans World Airline, and Melvin Nuss, manager of Reading (Pa.) Municipal Airport. Shown during a more serious moment, on right, are: Richard Maurer, secretary and general counsel, Chicago and Southern Air Lines; Earle Bigler, manager of Seattle-Tacoma Airport; J. A. Herlihy, vice president of United Air Lines.

Balance of the panel, left to right, consisted of Charles Duke, manager of Bendix Field, South Bend, Ind.; Louis N. Inwood, director of aviation, Kansas City, Mo.; Paul Brattain, vice president of Eastern Air Lines; Donald H. Connolly, director, department of aviation, Baltimore, Md.; O. M. (Red) Mosier, vice president of American Airlines.

*By* KEITH SAUNDERS

JOE, an oldtime porter at the Neil House in Columbus, Ohio, remarked to a delegate to the annual convention of the American Association of Airport Executive that "this organization sure has grown up since the last time it met here four or five years ago."

He referred, of course, to physical growth of the organization (fewer than 150 persons attended the previous AAAE convention in Columbus, while more than 500 were on hand this year), but there was ample evidence at the April 16-20 meeting that the organization also has grown up considerably in stature and prestige.

The program itself and the caliber of those present attested to the AAAE's attainment of maturity and its progress from the days when its meetings served only as a sounding board for the squawks of airport people against their customers and other users of their facilities—the airlines, the concessionaires, the military, the petroleum companies and private flyers—to its sincere present-day efforts to sit down with airport users and try to resolve their mutual problems and grievances, if any.

"Operation Cooperation" was the theme of the Columbus convention, and it was a happy choice, judging from the tenor of the discussions and speeches.

### Urges Constructive Action

Rep. Carl Hinshaw (R., Calif.) a luncheon speaker, keynoted the meeting when he said: "I feel that civil aviation has reached a point of maturity, at least in experience if not in size, where its component groups should be able to sit down around a table, examine their common problems calmly and realistically, and come up with a constructive plan of action."

Urging those present to keep in the forefront of their thinking the overriding importance of winning wider public acceptance and use of aviation as a whole, subordinating their pet individual projects to this larger aim, Hinshaw added:

". . . it would be highly desirable if both airlines and airport management could work together harmoniously on the problem of use charges. The air terminal is the focal point of aviation in the community. If it can be made self-supporting and attractive, it will win public esteem for all aviation. To make the air terminal self-supporting and attractive, without putting undue burdens on any user group, should be your common goal."

The subject of use charges got a good airing at a forum discussion in which five airline executives and five airport executives participated, with Wayne W. Parrish, editor and pub-

# AAAE's Biggest & Best Airport Show

NEW AAAE OFFICERS AND DIRECTORS are, left to right: William H. Lyons, airport manager, Norfolk, Va., third vice president; Joseph E. Hightower, airport manager, Knoxville, Tenn., director; R. W. F. (Bob) Schmidt, airport manager, Tucson, Ariz., director; Melvin H. Nuss, airport manager, Reading, Pa., president; Art E. Thomas, airport manager, Des Moines, Iowa; first vice president; Charles W. Duke, manager, St. Joseph County-Bendix Airport, South Bend, Ind., director; Earle S. Bigler, manager, Seattle-Tacoma Airport, second vice president; Francis T. Fox, airport manager, Worcester, Mass., secretary-treasurer. New director not in picture is Emery Cox, director of parks and airports, Wichita, Kans.

AN OVERFLOW AUDIENCE packed the convention hall to hear Capt. Eddie Rickenbacker, president of Eastern Air Lines, who was introduced by Walter Betsworth, AAE vice president, from Waterloo, Ia.

## Airport Equipment Display

AIRPORT EQUIPMENT MANUFACTURERS attracted keen interest with displays aimed at the representatives of perhaps the largest financial stake in U. S. aviation—an estimated two billion dollar airport investment. Typical of the displays along exposition row are those shown on this and the opposite page. Explaining the operation of CROUSE-HINDS lighting equipment were G. W. Bickerstaff, sales engineer, and J. S. Haney, of the aviation sales department. Shown discussing LINE MATERIAL high intensity equipment are, left to right, E. O. Olson, airport manager, Duluth, Minn.; Tom White and R. E. Madigan, of Line Material; Woodruff de Silva, manager of Los Angeles Municipal Airport. THE BRUSH DEVELOPMENT CO. had its recording equipment on display and also made recordings of various forum sessions during the convention.

SURFACE COMBUSTION CORP.'S Janitrol aircraft products were explained to airport operators by R. B. Hitchcock, aviation manager. BENDIX RADIO DIVISION of Bendix Aviation Corp. was represented by J. Walton Colvin and W. W. Price, while looking over the REVERE ELECTRIC MFG. CO. booth are Robert Skuldt, superintendent of municipal airport, Madison, Wis., and J. A. McDougall, manager of Revere's airport department.

lisher of AMERICAN AVIATION, as moderator.

It was brought out that there is still some difference of opinion on such questions as sliding-scale formula for landing fees vs weight formula, the periods over which landing-area use charges should be amortized and the bases upon which they should be computed, and the separation of ancillary charges for certain non-landing rights and privileges from the landing fees.

But on the whole, it was revealed that the airlines and the airports now are in substantial agreement on a number of matters on which they once differed, that they are getting closer to agreement on certain other matters, and that there are not many areas of disagreement remaining in which sincere attempts at cooperation cannot result in reasonably satisfactory solutions.

## Top-Level Airline People

An encouraging thing about the meeting was the presence of an unprecedented number of high-level airline officials, including: Ralph S. Daman, president of TWA; C. R. Smith, president, and Q. M. (Red) Mosier, vice president, American Airlines; Robert Love, president, All American Airways; Tom Davis, president, Piedmont Airlines; Capt. Eddie Rickenbacker, president, Paul Brattain and Les Arnold, vice presidents, Eastern Air Lines; S. T. (Stu) McAlister, director of properties, Capital Airlines; J. A. Herlihy, vice president—operations, United Air Lines; George Clay, secretary, TWA; Richard Maurer, secretary and general counsel, Chicago and Southern Air Lines; Hainer Hinshaw, assistant to the president, United; Holland Meacham, vice president, Slick Airways; George Cussen, executive vice president, The Flying Tiger Line.

Also encouraging was the fact that members of airport commissions and boards from a number of cities saw fit to accompany their airport managers to the convention, where they could get a good insight into some of the problems of operating an airport. Mason City, Iowa, sent its entire seven-member airport board.

The caliber of government representation at the meeting was of the highest, including: Civil Aeronautics Administrator Del W. Rentzel, who described the ways in which CAA is cooperating with airport managements in assembling, analyzing and disseminating information on successful airport practices; CAB Chairman Joseph J. O'Connell, Jr., who predicted that municipalities, airport operators and airlines will have to pay increasing attention to intelligent pricing policies for air transportation; and Representative Hinshaw, who called for united industry to the end that the industry might find the answers to its problems through a maximum of self-help and a minimum of government action.

SOCONY-VACUUM occupied largest exposition space. Shown are C. J. Graseck, sales representative (left), and L. H. Van Dyck, sales engineer.

## 48 Equipment Displays

In addition to a varied and information program of speeches and discussions, the AAAE convention this year featured an array of exhibits unmatched at any previous meeting of airport operators. There were 48 exhibitors in all who paid for booths at the Neil House in which to display products ranging from fire trucks and runway compactors to new types of lighting, radio equipment, paving materials and trip insurance machines.

In addition to the static exhibits at the hotel, one afternoon of the convention was given over to demonstrations at the airport of fire fighting units and runway construction and maintenance machinery.

## New AAAE Officers

Melvin H. Nuss, manager of the Reading, Pa., Municipal Airport and secretary-treasurer of the AAAE since 1947, was elected president for the coming year. Other officers were elected as follows:

Art E. Thomas, Des Moines, first vice president; Earle S. Bigler, manager, Seattle-Tacoma Airport, second vice president; William H. Lyons, manager, Norfolk, Va., Municipal, third vice president, and Francis T. Fox, Worcester, Mass., secretary-treasurer.

New directors elected were: Charles W. Duke, manager, St. Joseph County-Bendix Airport, South Bend, Ind.; Robert W. Schmidt, manager, Tucson, Arizona; Emery Cox, Wichita, Kansas, and Joseph E. Hightower, Knoxville.

The convention not only was the largest in the AAAE's history but it also was probably the best run. Credit for the smooth and efficient manner in which it went off, and for the fact that it made money and friends for the organization, was due largely to Jack Bolton, who had able assistance from his committees, from the Ohio Aviation Board, from the Texas, Shell and Gulf oil companies, and from William T. Raymond, representing the Air Transport Association.

ASSOCIATED AVIATION UNDERWRITERS' insurance dispensing machine and THE HAMILTON SCALE CO.'S new postage stamp machine with coin changer are viewed by William M. Churchill, AAU machine sales manager, and Howard T. Ailor, of Aircraft Services Consolidated, Toledo, Ohio, manufacturers representatives.

WALTER KIDDE & CO. displayed fire-fighting apparatus. Shown is Charles H. Smith, Jr., Sales representative.

INTERNATIONAL STEEL CO. featured its popular T-hangars. Shown are Fred H. Groeninger, sales representative, and Clyde Cole, airport manager, Flint, Mich.

*While Legislation Drags . . .*

# Jet Transport Engineering Moves Ahead

By William D. Perreault

IN THE MIDST of considerable gloom about the prospects of developing a commercial turbine-powered transport in this country, there is one brightspot. While civil and government agencies haggle over the terms of government assistance and the tentative legislation is cited as wholly inadequate, the designers and engineers are moving along at an encouraging pace.

No better example of this progress could exist than the Fifth Annual Flight Propulsion Meeting of the Institute of the Aeronautical Sciences at Cleveland recently. Those who have followed the engineering trends in turbine transports recognized a crystallization of thinking which will determine the course to be followed in ultimate designs.

Through meetings such as this, representatives of the airlines and manufacturers are gradually ironing out the rough spots in their earlier planning. There appears to have been a change in basic goals which has placed the aim for turboprop transports speeds at 400-450 mph and that for turbojet transports at 550-600 mph.

Also apparent is a growing realization that small increases in cruising speeds promised by some turboprop and even turbojet engines installation proposals would be wholly lost in accomplished block speeds because of the operational requirements which make it necessary for the turbine transport to operate at high altitudes.

Some classic examples of this discrepancy between cruising speeds and accomplished block speeds were discussed by R. D. Kelly, UAL engineer, in commenting on the Wright Brothers Lecture and reported in American Aviation for April 1, Since that time Kelly and F. F. Davis, also of United, toured Europe and reviewed jet transport progress. They presented some results of their study to the IAS meeting.

## Low Jet Noise Levels

One of the more interesting of their comments, exclusive of those reported earlier, had to do with noise levels in turbine-powered transports. Kelly and Davis attempted to carry on normal conversations in the cabins of both turboprop and turbojet transports and establish at what distance normal conversation could be readily understood.

In the rear cabin of a turboprop airplane normal conversation could be heard at 14 feet while in the front of the cabin at about seven feet. This compares with their figures of six and four feet respectively in a present-day reciprocating-engine transport.

Noise level in the jet transport was relatively high with conversation clear at 10 feet in the forward part of the cabin but only three feet at a point near the jet stacks and even less further back in the cabin. This would appear to emphasize the need for locating the engines far enough from the fuselage to keep the exhaust pattern clear of the fuselage.

The UAL engineers claimed that vibration in both turbine transport types was not detectable and laid stress on the fact that the noise level comparisons were at the cruising speeds of the respective airplanes. Consequently the turbine transports would normally be expected to have higher noise levels because of their higher speeds.

From time to time the ability of propeller designers to develop efficient designs for high speed turboprop installations has been questioned. T. B. Rhines, chief engineer of Hamilton Standard, presented some interesting figures on propeller developments. He introduced photos of many radical propeller blade designs which had been designed and tested but concluded that design refinements and not new designs are the answer to supersonic propellers.

Rhines illustrated the accomplishments of design refinements by pointing to the 1938 propeller installation on the Douglas DC-3 which weighed 397 pounds, had 11½ foot diameter and accommodated 1,200 horsepower. Since then design refinements have made it possible to provide a 395-pound propeller incorporating higher rate of pitch change, reversing features and pitch synchronization for the 2,400 horsepower engine of the Douglas DC-6.

## High-Speed Prop Tests

The Hamilton Standard engineer presented graphs to show what has been accomplished in improving the efficiency of high-speed propellers. The graphs indicated that efficiencies as high as .93 can now be obtained at mach .303, up to .86 at mach .713 and .67 at mach .899.

In general, Rhines said, efficiencies better than 75% and possibly 80% might be achieved at mach .9 at optimum operating conditions. Designs must be related to the flight conditions where high efficiency is needed.

The propeller requirements are directly tied to the practical operating

**Rainbow Development—**

Republic estimates that for a turboprop version of the Rainbow transport powered by four Allison T-40s would cruise at 450-500 mph. Another four-jet version would reach mach .9 with a 35 degrees sweep on the wings. This aircraft would cruise at up to 580 mph.

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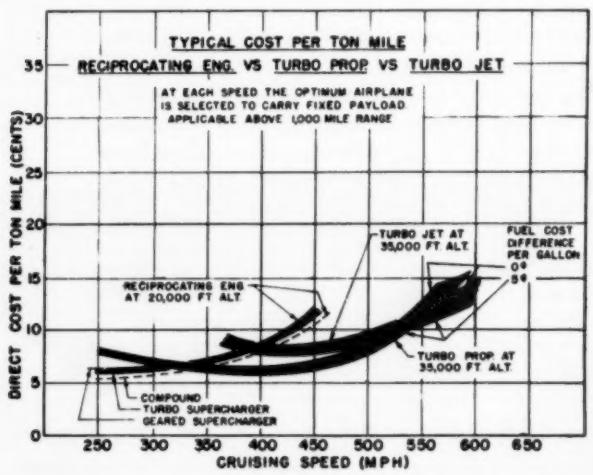
aspects of the turboprop engines. Two Wright Aeronautical engineers, E. V. Farrar and R. E. Johnson, presented an interesting evaluation of the relative merits of supercharged reciprocating, turboprop and turbojet engines. It is quite common for comparative analysis of various powerplant results to be based on aircraft of such widely varying characteristics that the end results are anything but conclusive.

The Wright engineers divorced the engines from the airplanes and established parameters on which to base comparisons. They presented graphs to show the relative amount of useful energy available from fuel burned toward useful propulsion versus that going to overcome induced and parasite drag, of the powerplant, propulsive losses, internal losses and basic thermodynamic cycle losses.

## Doubt Fuel Savings

The end results of their study can best be realized by reference to the accompanying figure which shows the typical cost per ton mile with each type powerplant at varying cruising speeds. One of the important points raised by the engineers was the cost of jet engine fuels. Said the Wright representatives, "With all due apologies to the fuel producers, we doubt that there will be much actual difference between the (price of the) two types of fuel if gasoline quantity decreases and jet fuel quantity increases materially."

At the 1,000-mile range condition and beyond, the engineers concluded, the compound reciprocating engine gives the lowest cost per ton-mile below about 350 mph. From 350 to 500 mph the turboprop engine provides the lowest cost per ton-mile. It will fly 100 mph faster than the reciprocating-engine airplane for the same cost.


TYPICAL COST PER TON MILE
RECIPROCATING ENG. VS TURBO PROP VS TURBO JET
AT EACH SPEED THE OPTIMUM AIRPLANE IS SELECTED TO CARRY FIXED PAYLOAD APPLICABLE ABOVE 1,000 MILE RANGE
DIRECT COST PER TON MILE (CENTS)
CRUISING SPEED (MPH)
TURBO JET AT 35,000 FT. ALT.
FUEL COST DIFFERENCE PER GALLON
RECIPROCATING ENG AT 20,000 FT ALT.
TURBO PROP AT 35,000 FT. ALT.
COMPOUND TURBO SUPERCHARGER
GEARED SUPERCHARGER

The ton-mile cost of flying with the turbojet is approximately 30% greater than that of the turboprop and the ton-mile cost of 600 mph with a turbojet is twice that of 400 mph with a turboprop. The comparisons are based on major improvements in presentday engines but all within practical attainment.

Another interesting conclusion of this paper: the turboprop will reach full development after the turbojet unless military requirements make it advisable for the services to support turboprop development more fully than seems probable at this time.

Another interesting approach to the same problem, an attempt to compare each type of powerplant on an equitable basis, was offered by A. Kartveli, vice president and chief engineer with Republic Aviation Corp.

Kartveli approached the problem by preparing design studies of the Republic Rainbow powered by each type engine. While gross weight, fuselage shape, fuel, etc., were kept relatively constant in his comparisons, some changes were made in wing configuration to provide optimum conditions for each type powerplant.

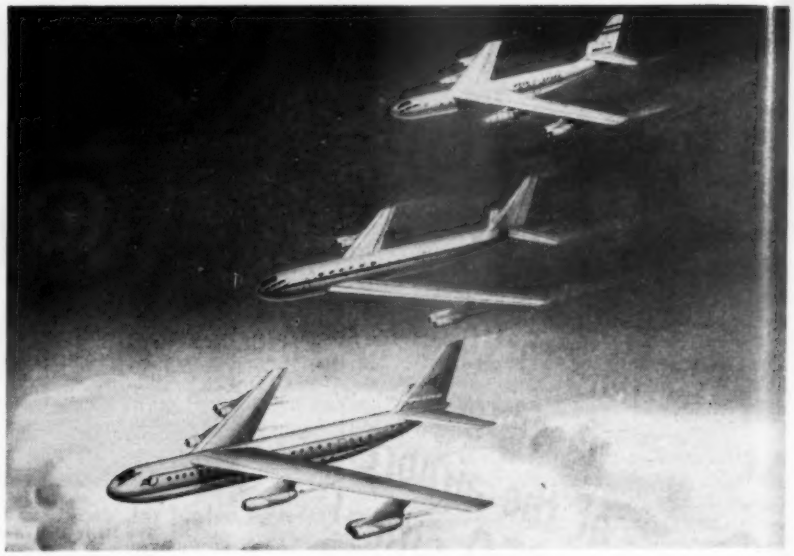
Basing his analysis on flight operations with 10,000 pounds available payload, Kartveli said the turbojet Rainbow would have a range of 1,500-2,000 miles at speeds up to 580 mph. To accomplish this end the wing was modified to incorporate 35° sweepback and the tail surfaces were also swept. Limiting mach number of this 126,150 pound Rainbow would be .9. Wing area is 2,000 square feet and aspect ratio is 8. The power consists of four jet engines installed two to a nacelle on the underside of the wing. Slim nacelle design was made possible by staggering the engines in the nacelle.

For ranges of 2,500 to 4,500 miles and speed in the 450-500-pmh range, Kartveli concluded that the turboprop engine offered more promise. The turboprop Rainbow would have four Allison T-40 engines buried between the wing spars. Drive shafts extending through the front spar were used to drive contra-rotating propellers. Maximum nacelle diameter would be 40 inches.

## 3-Ton Weight Saving

As compared to a reciprocating-engine installation, the turboprops would bring about a weight saving of 6,600 pounds. Gross weight of the turboprop Rainbow is 119,400 pounds, fuel capacity 6,200 gallons, wing area 1,750 square feet and limiting mach number .8 dictated by buffeting.

A range of 4,750 miles would be possible at 40,000 feet altitude with the turboprop, flying at 410 mph. At 20,000 feet altitude the design has a range of 1,875 miles and cruising speed of 515 mph. On transcontinental flights of 2,750 miles at 30,000 feet altitude, cruising speed would be



**Three Styles**—These three designs are artists sketches indicating the thinking at the Boeing Airplane Co. relative to jet transport designs. The entire series has the basic characteristics of the Boeing B-47. Major differences appear to be the double-deck design of the foremost airplane, the low-wing and four-engine arrangement of the center plane and the externally mounted fuel cells of the remaining model. Boeing states that it is considering use of reverse rocket motors, drag parachutes, spoilers or improved brakes to aid in deceleration during landings.

500 mph, mach .1 below the buffeting point.

Some stablizing thoughts were offered by Eastern Air Lines' Charles Froesch in a paper titled "Looking Ahead with Air Transport."

Froesch introduced figures which showed that on an airport-to-airport basis the helicopter is faster than present twin-engine transports for distances up to 30 miles and for distances up to 180 miles, considering overall travel time origin to destination. He showed that overall travel cost by air and connecting ground service between a number of key cities located 51 to 180 miles apart ranged from 7 to 9½ cents per mile.

### Medium-Range Jets

Froesch outlined his ideas of basic requirements of a medium-range jet transport including the need for four turbojet engines, 60-80 passenger seats, provision for 2,000 pounds mail and express, cruising speed of 600 mph, range of 2,500 miles plus two hours fuel reserve, cruising altitude of 30-35,000 feet and a stall speed of 85 mph.

For short-range operation he cited need for 36-40 passengers plus the same mail and express accommodations, cruising speed of 400 mph at 20,000 feet altitude, range of 1,200 miles plus two hours (with additional tankage for 1,600 to 1,800 miles range), operating altitude of 20,000 feet or less and stall speed of 75 mph. This would be a twin-engine ship. While Froesch called for low-wing long-range transport, he urged a high-wing design for the latter short-range airplane.

## Who Owns the Slope Line System?

### . . . Former LAES Man Obtains Patent

Does the slope line approach light system, which is the current standard for civil and military aviation in this country, belong to the Civil Aeronautics Administration, which developed it, or does it belong to Dr. Maurice A. Garbell, who has procured a patent on it?

The CAA last week wasn't sure of the answer to that one, pending further study by the Office of General Counsel, but it was the position of Administrator Delos W. Rentzel that anything developed under a government project and paid for with government funds belongs to the government, even though the government may not have gone through the formality of having it patented.

Rentzel said it would be his inclination to ignore Garbell unless the latter should bring a suit against CAA for alleged infringement of his patent and the courts subsequently upheld the validity of the patent, which was issued to Garbell on March 21.

Garbell was formerly technical director of the CAA's Landings Aids Experiment Station at Arcata, California, where evaluation tests of the CAA-developed slope line approach light system were made by Transocean Air Lines under a CAA contract.

Cory Pearson and the late Jerry Sweet, two CAA lighting engineers, are credited by CAA with developing the slope line system. It consists of two rows of diagonal bar lights which appear as solid lines to the pilot of an incoming plane so long as he is on course, but when the plane deviates the lights appear as a broken diagonal. During the evaluation work at Arcata, a few horizontal bars were added to the system for distance-judging purposes, and it is believed that Garbell based his patent application on this improvement.

The slope line system, after much testing at Arcata, was finally adopted as standard by the Army-Navy-Civil Committee. A Munitions Board subcommittee subsequently ruled that the slope line does not represent an adequate system, but agreed that it remain the recognized standard until a more satisfactory one could be evaluated and adopted.

Meanwhile, CAA has not provided funds for the Arcata station in its fiscal 1951 budget, which means that the station will have to close before any further evaluation of approach lighting systems can be made.

CAA already has installed slope line systems at Washington National Airport, at New York International and at Los Angeles International, and other installations are contemplated. If Garbell's patent is valid, he might assess a royalty fee against CAA for each such installation.

Dr. Garbell also currently is suing Consolidated Vultee Aircraft Company for alleged infringement of a patent he claims to hold on the wing of the Convair Liner.

**Boom Refueling**—These in-flight photographs, illustrate Boeing Airplane Co.'s rigid boom refueling system. Here a B-29 tanker refuels a B-50D. The fins, or "rudder," on the telescopic boom are actually airfoils; an operator stationed in the tail of the tanker "flies" the boom into contact with the refueling nozzle in the B-50D. The boom is retracted and secured on a tubular support jutting from the operator's station during take-offs and landings.

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## Lower Break-Evens Needed Under Service Mail Rate

Citing the growing tendency on the part of government officials to establish a service rate for carriage of mail by the airlines, Harold D. Koontz, director of commercial sales for Consolidated Vultee Aircraft, has urged that new emphasis be placed on reducing break-even load factors.

Speaking as guest of honor at the ATA's annual Engineering and Maintenance Conference at Kansas City last month, Koontz, warned against over-optimism based on the high net income of the domestic airlines during 1949. He noted that the 1949 net operating income of $35 million would have been reduced to $4 million if the airlines were operating on a service mail rate of 60c per ton-mile.

Koontz

This same rate would have reduced the number of lines showing a profit for 1949 from 15 to four. Since an air mail service rate has been recommended by CAB in its annual report, by the President in his budget message, and by representatives of the Post Office, Koontz considered it a matter for action.

Koontz stated that the airlines should strive for a break-even point based on a 45% payload factor, a 50% passenger load factor and a service mail carriage rate. With this as a yardstick, only two of the 16 carriers met the test during 1949.

Individual airline costs per available ton-mile have dropped as much as 25% since 1947, Koontz said, but the industry average was only a 3% reduction. This 3% drop in total cost per available ton-mile is equal to a $15,000,000 saving in the past two years and was accomplished despite a 20% rise in wages.

## Industry Personnel

**H. L. Howard,** executive vice president and treasurer of Texas Engineering and Manufacturing Co., has been elected president of Luscombe Airplane Corp., following consummation of the Luscombe reorganization plan. Luscombe directors, all of whom are on the TEMCO board, are **D. Harold Byrd, H. L. Howard** and **Robert McCulloch.**

**Jay Morrison,** formerly staff assistant to the president of Boeing Airplane Co., has been appointed manager of the company's gas turbine project, which now assumes the status of an independent department. Chief project engineer for the turbine's further development will be **S. D. Hage,** who has been in charge of the propulsion development unit.

Morrison

**Thomas F. Piper** has been appointed assistant general manager of Piper Aircraft Corp. He has been with the company in various capacities since 1936.

**H. C. Pettit** has been appointed as sales manager of the Aircraft Division of Aeronca Aircraft Corp. He succeeds **Walton B. St. John,** who has joined Lear, Inc., as sales manager of the aircraft division.

**Melvin H. Lockett** has been elected a director of Ryan Aeronautical Co., replacing **Frank N. Phillips,** deceased.

**Donald M. Parker,** former general sales manager for Piper Aircraft Corp., has been appointed contracts manager for the Piasecki Helicopter Corp. In aviation for over 20 years, Parker has been with Pan American World Airways, Wright Aeronautical and Republic Aviation before going with Piper.

**R. O. Bullwinkel,** who recently resigned from Northwest Airlines as vice president-traffic, has been appointed general manager of the Sunde & D'Evers Company of Seattle, old established marine supply house.

**Guy W. Vaughan,** former chairman of the board of Curtiss-Wright Corporation and Wright Aeronautical Corp., has been elected a director of Aircraft Maintenance International, Inc.

**Raymond J. Fencl** has been appointed as service manager of the aircraft engine division of Continental Motors Corporation, succeeding **Al Vandenberg,** resigned.

**J. V. Naish** has been promoted from director of contracts to director of sales for Consolidated Vultee Aircraft Corp. **J. G. Zevely,** former assistant vice president of American Airlines and more recently Convair's contracts administration supervisor for military contracts in the San Diego division, has been promoted to become manager of contracts for the division.

**Claude N. Monson** has been made staff assistant to Pete Morgan, vice president and treasurer of the AiResearch Manufacturing Co. He had recently resigned his position as executive vice president of Northrop Aircraft.

## Aviation Calendar

**May 5-6**—National Intercollegiate Air Meet, Stephens College, Columbia, Mo.

**May 18-19**—Corporation Aircraft Owners Association annual meeting and Third National Forum, Hotel Statler, Washington, D. C.

**May 18-20**—Women's National Aeronautical Ass'n annual meeting, Tulsa, Okla.

**May 19-20**—Institute of the Aeronautical Sciences 7th annual Personal Aircraft meeting, Lassen Hotel, Wichita, Kansas.

**May 20-21**—National Air Carnival, Birmingham, Alabama.

**May 22-23**—Third annual Air Transportation conference, Purdue University School of Aeronautics, Lafayette, Indiana.

**May 23**—Aircraft Technical Committee, Aircraft Industries Association, annual meeting, Hotel Carlton, Washington, D. C.

**May 27**—Philadelphia Aviation Country Club 4th annual spring air regatta, Wings Field, Ambler, Pennsylvania.

**May 27-28**—Airlines Medical Directors Association 7th annual meeting, Palmer House, Chicago, Illinois.

**May 29-31**—Aero Medical Association 21st annual meeting, Palmer House, Chicago, Illinois.

**June 1-3**—Aviation Writers Association convention, Mount Royal Hotel, Montreal.

**June 2-11**—7th annual Michigan Aviation Week (sponsored by Aero Club of Mich.).

**June 3-4**—Fifth annual Shawnee Air Fair and Industrial Exposition, Shawnee, Okla.

**June 4-9**—SAE summer meeting, French Lick Springs Hotel, French Lick, Indiana.

**June 4-9**—CAA Airport Advisory Committee meeting, Miami, Florida.

**June 10-13**—National Aeronautic Association 28th annual convention, Hotel Statler, St. Louis, Missouri.

**June 21-25**—Ninety-Nines convention, Ft. Clark Guest Ranch, Branchettsville, Tex.

**June 22-23**—Aviation Distributors and Manufacturers Association midyear meeting, Edgewater Beach Hotel, Chicago, Illinois.

**June 26-30**—American Society for Testing Materials annual meeting and exhibit of testing apparatus and equipment, Atlantic City, New Jersey.

**July 12-14**—Institute of the Aeronautical Sciences annual summer meeting, IAS Western Headquarters Bldg., Los Angeles, California.

**July 14-16**—National Pilots Air Meet and Races, Chattanooga Municipal Airport, Chattanooga, Tennessee.

**July 25-30**—Academy of Model Aeronautics national model airplane championship contest, Naval Air Station, Dallas, Texas.

**July 30-Aug. 13**—National soaring contest, Grand Prairie, Texas.

### International

**May 9**—IATA Composite traffic conferences 1-2-3, Madrid, Spain.

**May 9**—IATA Fourth technical conference, Asbury Park, New Jersey.

**May 30**—ICAO Fourth Assembly, Montreal, Quebec.

**May 30**—ICAO Legal Committee meeting, Montreal, Quebec.

**Sept. 5-10**—Society of British Aircraft Constructors, annual flying display and exhibition, Farnborough, England.

**Oct. 16-20**—IATA Annual general meeting, Fairmont Hotel, San Francisco, California.

**Between the Lines:**

# What Saucers Aren't

**By James J. Haggerty, Jr.**

TO DATE we have maintained a dignified and restrained silence on the question of flying saucers, feeling that we had nothing to contribute to the problem, no suggestions as to what they might be.

But in the last couple of months a radio commentator named Henry J. Taylor, billed by his sponsors as a "noted economist, author and journalist" has gained a certain prominence as a saucer expert, and on the possibility that some of the readers of this magazine may have been taken in by the sort of nonsense Taylor is peddling, we should like to controvert some of his—baloney, we guess, is the only printable word, although there are others more apt.

Never having heard of Henry until he blossomed overnight as a saucer pundit, we have no information as to how good an economist he is. But we hope, for the sake of his livelihood, that he is better at it than he is at saucer experting. As we said, we have no suggestions as to what the saucers might be, but we have a few words as to what they are not: They are not anything that Henry J. Taylor, noted economist, author and journalist, says they are.

From his sponsors, who solemnly assure us that "millions" listen to Henry every week, we obtained a transcript of his most "important" saucer broadcast, and now that we have stopped laughing we will try to discuss it with you.

Henry starts off by saying, "Now either the so-called 'flying saucers' exist, or they don't. No one can quarrel with that as a starter." He's right. We won't quarrel with that statement. It is probably the only sentence in the broadcast that contains a modicum of sense.

## Two Mysteries, Not Just One

Next, Henry assures us (and we have a mental picture of him leering into the microphone with the smug look of a guy divulging some inside dope) that they do exist, and moreover, that they come from "right here in the U.S.A." But first, Henry says, he must point out that there are two mysteries in our skies, not just one. The reported cigar-shaped objects which belch flames are different from the "true flying saucer."

But these other phantoms are also American made, says Henry. They are, as a matter of fact, a "secret" Navy experimental fighter called the XF5#U (sic). "It is a great jet airplane of incredible speed. It really looks like, and is shaped like, a pancake. . . . Around the edge of its disc-like body is a series of jet-engine louvers . . . Its jet motors are inside the pancake shape . . . It flies faster than I am permitted to say. No, this disc did not come from Russia . . . It did not come from Mars. It came from Maryland. I'm glad to report that the men who are in it are Americans —like you or me. This our own Navy confirmed . . .."

We don't know who in the Navy confirmed this, but if they find him they'll probably put him in a psycho ward. The Navy officer to whom we read this piece of profound intelligence roared so loudly that he drew a couple of nasty looks from a four-striper and a three-star admiral.

The XF5#U Henry mentions was the Chance Vought XF5U-1, a convertible airplane designed to provide a wide range of forward speed, from a 40 mph landing speed to an estimated 425 mph top speed. It was not "a great jet airplane of incredible speed." It was not "great," but as a matter of fact a rather small airplane; it was not "jet," but powered by a pair of comparatively low-horsepower Pratt & Whitney piston engines; and its "incredible speed" must be left to the imagination, inasmuch as it never flew. The Navy has abandoned the project and is not even contemplating any jet-powered versions; the only plane ever built was dismantled in January, 1949. The National Advisory Committee for Aeronautics is still evaluating the design with a wooden scale model, but it is safe to say they have not installed jet engines and are not sending it about the country scaring the wits out of the populace.

Anyway, Henry says, these are not the true saucers. Here is the lowdown on the true saucers, as per Henry: "There are several types—but nobody is inside any of them. They vary in size—from 20 inches in diameter—to 250 feet in diameter—There are several shapes—but nearly all of them are round."

"And," concludes our saucer expert, "I know what these so-called 'flying saucers' are used for. It's very important and wonderful."

## Air Force Is Baffled, Too

Well, if Henry knows what the saucers are used for, he has the edge on every USAF officer we've talked to—and they're not just being coy. From 1946, when the saucer business started, until early 1948, we were assigned as Air Force public relations officer in the Pentagon handling the release of information on USAF aircraft, and it fell our unhappy lot to become the buffer of the saucer queries. When they first started, we made an honest attempt to find out if some top-secret Air Force project could be responsible. We talked to the aircraft people and the propulsion people and begged them to let us in on the secret, if any, not necessarily to release the information to the public, but just to get the background necessary to "sluff off" the questions. We were cleared, at that time, for secret information, and we would have been let in on the story if there had been one; but everyone concerned with experimental projects assured us, with Bible-swearing solemnity, that there was no USAF airplane or missile program which could account for the saucer reports. We have been reassured recently.

Henry goes on to say that your chances of finding a saucer are slim, "because most of them are made of material which disintegrates in the air and disappears a given time." We know of no such metal, but if there is one it has unlimited possibilities. The Treasury could mint coins of it, palm them off to unsuspecting citizens and clear the national debt in no time by a process of disintegration. If perchance you should find an undisintegrated disc, though, you will see stenciled on the side "Military Secret of the United States of America," followed by "Air Forces—" and a number according to Henry. The language is somewhat unlikely to start with, but if the Air Force were to stencil its name on a saucer, we think it would at least be spelled correctly—there is no plural 's' in Air Force.

As we said, we have nothing to contribute to what the saucers might be. The Air Force has written off 97% of the reports as hallucination, hoax or mass hysteria. It's the other three per cent which interest us—are they or aren't they? We don't know. We do know this—Henry J. Taylor doesn't know either.

# Production Spotlight

With the fiscal year 1950 well into its 10th month, the Air Force and Navy finally got around to disclosing some details of their respective aircraft procurement programs, after having fumbled with announcement plans since last September. The belated announcements immediately drew fire from several sources. Rep. Carl Hinshaw (R., Calif.) blasted the announcements as "cruel and insincere" because they created the impression among the unemployed of the aircraft industry that the vast dollar totals released were new business, when actually they were only belated confirmations of contracts signed months earlier. Manufacturers complained that the announcements gave their employes and stockholders a false impression of company backlog, since they were repetitions of information which had leaked out earlier.

Despite all the hubbub, the services were chary with details; they released only the types of planes they were buying and the dollar values involved—no numbers, no airframe weights. With an inconsistency in perfect harmony with the stupid bungling of the release of information, the Air Force refused to release the prime contractor's share of the total dollar value, saying it was "classified." To the Navy, however, it was not classified; Navy officials cheerfully released the information. The Navy, asked for airframe weight data, refused to divulge it—it was classified; but the Air Force, with no scruples, made airframe weight available.

The result of such incompetent handling is that stock brokers, stockholders, manufacturers and others interested have only a vague, confused picture of the aircraft procurement program. AMERICAN AVIATION, therefore, has rounded up all the procurement data available, from official releases, company annual reports, our own files and other sources.

AMERICAN AVIATION's resume of the fiscal 1950 aircraft procurement show that Boeing Airplane Co. is the top military contractor from the standpoint of both dollar value and airframe weight to be produced, with Air Force orders for B-47 jet bombers and C-97 transports adding about $135,000,000 and over 5,300,000 airframe pounds to the company backlog. Second place in the procurement sweepstakes goes to Consolidated Vultee Aircraft Corp. with Air Force orders totaling about $130,000,000 and 5,000,000 airframe pounds for B-46 bombers and T-29 trainers.

Next in line were Douglas Aircraft Co., with about $92,700,000 and 4,200,000 airframe pounds in both Air Force and Navy orders; Lockheed Aircraft Corp. $106,000,000, 3,300,000 pounds; North American Aviation $106,000,000, 2,500,000 pounds; and Grumman Aircraft Engineering Corp., $92,500,000, 2,100,000 pounds.

## Air Force

In the fiscal 1950, USAF will buy 1,250 planes at a total cost of $1,203,200,000. In addition, $94,300,000 will be obligated for related items of equipment or service, such as transportation, ground handling equipment, etc. The following is a breakdown:

| Company | Plane Type | Number | Airframe Weight (lbs.) [1] | Prime Contractor's Share [2] | Overall cost of order [3] |
|---|---|---|---|---|---|
| Boeing Airplane Co. | B-47 jet bomber | 82 | 4,600,000 | $135,000,000 | $303,600,000 |
| | C-97 transport | 14 | 710,000 | 20,000,000 | 32,800,000 |
| Consolidated Vultee Aircraft Corp. | B-36 bomber & RB-36 recon. a/c | 47 | 4,800,000 | 125,000,000 | 267,800,000 |
| | T-29 trainer | 12 | 225,000 | 5,200,000 | 9,800,000 |
| Douglas Aircraft Co. | C-124 transport | 36 | 2,600,000 | 54,000,000 | 84,500,000 |
| Fairchild Aircraft Division | C-119 troop carrier | 53 | 1,400,000 | 20,000,000 | 40,600,000 |
| Grumman Aircraft Engineering Corp. | SA-16 amphibian | 11 | 150,000 | 4,500,000 | 7,800,000 |
| Lockheed Aircraft Corp. | F-94 jet fighter | 150 | 1,000,000 | 65,000,000 | 120,000,000 |
| | F-97 jet fighter | 108 | 700,000 | | |
| | T-33 jet trainer | 125 | 600,000 | 15,000,000 | 26,900,000 |
| North American Aviation, Inc. | F-86 jet fighter | 111 | 800,000 | 20,000,000 | 34,400,000 |
| | F-95 jet fighter | 124 | 950,000 | 65,000,000 | 130,900,000 |
| | T-28 trainer | 125 | 400,000 | 8,500,000 | 15,600,000 |
| Northrop Aircraft, Inc. | F-89 jet fighter | 64 | 1,000,000 | 40,000,000 | 81,800,000 |
| Piasecki Helicopter Corp. | H-21 helicopter | 22 | 120,000 | 9,300,000 | 12,500,000 |
| Republic Aviation Corp. | F-84 jet fighter | 120 | 850,000 | 19,500,000 | 37,400,000 |

[1] Airframe weights of individual aircraft as listed in "The Buyer's Guide," official USAF publication.
[2] AMERICAN AVIATION estimates, based on company statements and other sources.
[3] Includes prime contractor's share plus cost of engines, propellers, armament, communications equipment and other items supplied to the manufacturer by the government (Government Furnished Property.)

## Navy

The Navy's fiscal 1950 program calls for the purchase of 798 new aircraft at a total cost of $557,500,000. The estimated cost of aircraft and spares is $550,600,000. Another $6,900,000 will go for related items such as ground handling equipment. To date, $375,860,912 worth of aircraft contracts have been let; another $174,700,000 worth, primarily for Government Furnished Equipment, but also including additional aircraft, is now in the process of negotiation. The following is a breakdown of contracts let to date:

| Company | Plane Type | Number | Airframe Weight (lbs.) [1] | Prime Contractor's Share [2] | Overall cost of order [3] |
|---|---|---|---|---|---|
| Douglas Aircraft Co. | F3D jet fighter | 70 | 700,000 | $30,036,364 | $61,666,933 |
| | AD attack bomber | 53 | 350,000 | 8,724,360 | 12,121,360 |
| Grumman Aircraft Engineering Corp. | F9F jet fighter | 242 | 1,500,000 | 57,163,841 | 92,902,841 |
| | AF attack bomber | 72 | 500,000 | 31,115,714 | 41,308,714 |
| Lockheed Aircraft Corp. | P2V patrol bomber | 45 | 1,100,000 | 25,427,942 | 36,700,942 |
| | TO jet trainer | 10 | 50,000 | 1,188,000 | 1,265,000 |
| The Glenn L. Martin Co. | P5M patrol bomber | 5 | 200,000 | 22,368,562 | 31,406,562 |
| McDonnell Aircraft Corp. | F2H jet fighter | 140 | 700,000 | 34,539,434 | 68,673,434 |
| North American Aviation, Inc. | AJ attack bomber | 15 | 350,000 | 12,844,982 | 16,583,982 |
| Piasecki Helicopter Corp. | HUP helicopter | 15 | 35,000 | 3,706,064 | 4,156,064 |
| Vance Vought Aircraft Division | F4U-5 fighter | 60 | 400,000 | 7,812,000 | 9,112,000 |
| | | 727 | 6,385,000 | $234,927,263 | $375,860,912 |

[1] AMERICAN AVIATION estimates.
[2] Official Navy figures.
[3] Includes prime contractor's share plus cost of engines, propellers, etc.

# American Aviation Flight Assessment . . .

## 1--Lockheed's Shooting Star

By RICHARD G. WORCESTER

*(Editor's Note: This is the first in a series of reports on flight characteristics of current aircraft models to be made by Design-Engineering Editor R. G. Worcester. The analyses will be based on actual flight experience with the aircraft involved. Mr. Worcester's piloting experience includes some 120 different types of aircraft, including British jet models.)*

NOBODY—least of all in Lockheed itself—would pretend that the basic Shooting Star design altogether represents modern ideas of transonic flight but the F-80 day interceptor is still the backbone of USAF squadrons.

It is the weapon by which U. S. air strength is directly measured in the occupied countries and war experience has been built into the 1,600-odd aircraft so far delivered. As much could not be said of any other fighter—promising though some of the newer ones are.

When an aircraft becomes as well known and as well liked as this, the USAF is apt to show its affection for the dear old tub by hanging bigger warloads outside and insisting that they are all carried at mach .8.

The true measure of success of the F-80 is the time it has taken to build a replacement aircraft of comparable range and low-speed characteristics with a performance high enough to justify the cost of production.

### Starting, Takeoff, Stability

After plugging in the mains rectifier starter you move the throttle into a cut-off position and press the starter button. In 10 seconds the gas is lit and after 20 seconds the jet pipe temperature has hit 720° before dropping to 600°. When engine speed has reached 24% push the throttle into the idling position and the JPT jumps to 820° then sinks to 600°. After about 50 seconds the engine is idling. Allison could perhaps clip some time off this schedule; they get the gas lit quickly but the engine ought to be sustaining itself after 30 seconds.

The cockpit is well arranged and, like Cleopatra's nose, of perfect dimensions. As in the Vampire the mistake has been made of putting the fuel contents indicators centrally on the panel and low so that the stick obstructs a view. There is a case for putting the "gallons remaining" indicator up near the gunsight.

I lament the absence of a separate machmeter—the red line on the ASI is useless except at sea level. An electrically operated trim button on the stick is a great luxury.

View from the front seat in the air or on the ground is good. View from the back seat of the trainer on the ground is alright but could be improved when flying slowly. Response to throttle is good. There's nothing like a centrifugal jet engine for liveliness plus solid reliability and the way it will omnivorously eat (and seem to like) sand or ice.

### Easy to Handle

On takeoff the elevator begins to have effect at about 40 mph, the nosewheel can be lifted at about 80 mph and slight back pull at 120 mph will edge the ship off the ground to start a flat flight path busting over the upwind boundary at 250 mph. The wheels go up in eight seconds with no change in longitudinal trim. The climb feels comfortable anywhere between 200 and 350 mph.

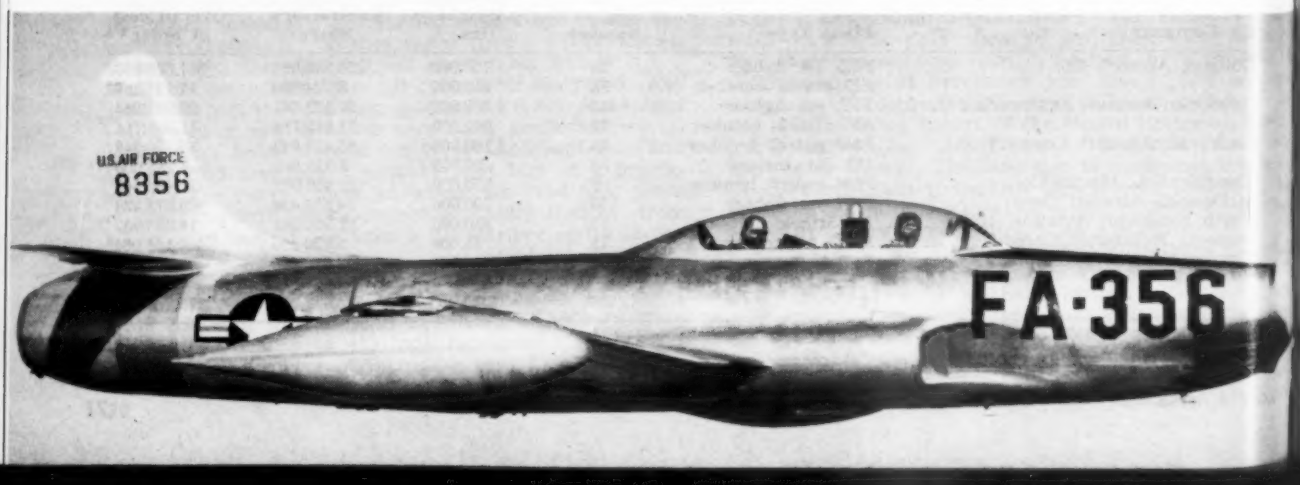
The ailerons are too light and the rudder is too heavy for what we call true harmony but the aircraft is easy and pleasant to handle. The 15.1 aileron boost is like being on a razor's edge. Stick forces of one-pound will produce 30° of lateral change and so you only have to breathe to tip the aircraft on end. The maximum rate of roll is 155 deg./sec. at 300 mph which is good by U. S. standards and phenomenal by European. Choice of this boost ratio means that precision over small changes of lateral control is sacrificed for a high rate of roll. You need the rate of roll in air combat but you need lateral precision for gun aiming.

### Trim Takes Over

The elevator trim takes over when five lb. of stick force is applied. You can do a two-G turn without the trim taking over so the gradient of elevator control is less than five lb./G is probably about four. The maximum permitted acceleration with tanks on is six G's so you can easily overstress the aircraft with one hand. However 11.2G has been recorded momentarily and a nine-G turn through 360° has also been achieved by some Tarzan at the control.

With tanks the aircraft is neutrally stable. Previous experience with positively stable aircraft rendered neutrally stable by carrying special loads has convinced me that this is no handicap. There is indeed a school of thought which holds that a neutrally stable fighter is the better.

Directionally, as usual with jets, the rudder isn't much use especially at high speeds. The military have, I think greatly underestimated the value of the rudder in their fighter specifications. Suppose, for instance, you dive down to come up under the target and find while pulling out




**Family Resemblance**— The Lockheed F-94 Night Fighter is in effect a TF-80 trainer with radar and an afterburner. The critical mach number and performance except for the climb is also similar to the standard Shooting Star.

the heading is slightly off. You correct by using a mixture of aileron and elevator.

With a powerful rudder able to hit a transverse acceleration of 3 G's (like Convair's delta wing) you could then kick the bead straight into the target. A renaissance in power-operated rudders would be helpful.

## Stall, Compressibility, Landing

The stall at 22,000 feet with tanks on, but nearly empty, came at 120 mph IAS, wheels and flaps down, or 145 mph IAS clean. In the first case gentle instability and control buffeting started 5 mph above the stall. There is less stall warning than in the Meteor, but the stall of the Shooting Star is more docile with less tendency to drop wing and less height to regain.

There is less than —¼G as the nose drops. The wing dropped 20° once and the change in heading on recovery was 15°. The spin is apparently characterized by rapid changes in attitude but the recovery is conventional and complete in half a turn. Wing tanks have to be jettisoned before recovery is started.

In a dive at 380 mph IAS at 10,000 feet the controls heavy up a little but the elevator is still light. Compressibility buffeting is felt on the structure and through the stick but not enough to make gun aiming difficult.

The same conditions are felt at 420 mph at 9,000 feet and about 460 mph at 8,000 feet which is 607 mph CAS (besides the PEC there is a compressibility error in the pitot head of about 10 mph which must be taken into account). This CAS gives an ICAN mach number of .86 but the true mach number was less than this as the temperature was much higher than ICAN. At this speed the wing tanks were vibrating at about four reversals/sec. through an amplitude of about three inches. The wing was vibrating in sympathy. It all looked hectic but there were no ill effects.

The high mach number characteristics seem to me better than those of the Meteor. The Shooting Star has a nose-down change in trim with excessive transonic drag which could act against the pilot. Aerobatics with the tanks on are allowed but maneuvers in the vertical plane are not advised much above 15,000 at full load.

## Howling Dive Brakes

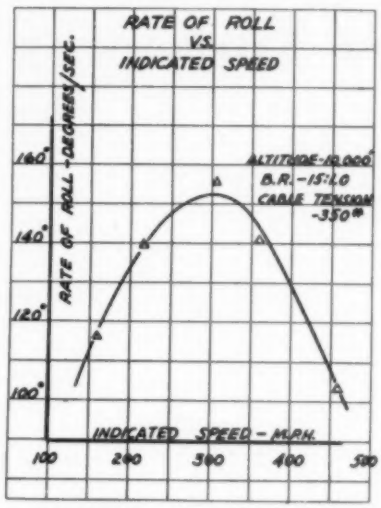
Dive brakes under the fuselage open in two seconds and cause a howling noise, allowing the angle of dive to be more than doubled (for given conditions a dive of eight deg. can be increased to 18). The dive brakes do not hold the aircraft anything like as much as in the Meteor. AiResearch, by the way, makes a refrigeration turbine the size of a man's hand which drops the cabin temperature 135°. This and the cabin pressure system (differential 2.5 lb.) make flying the aircraft a pleasure.

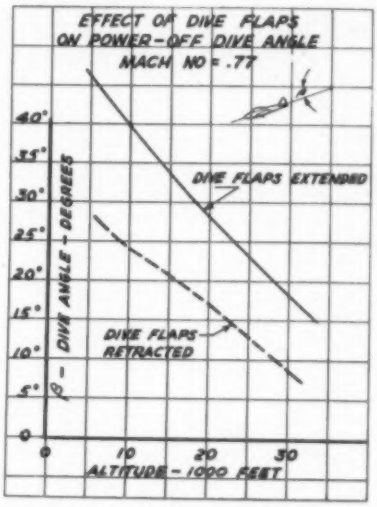
The approach speed is 130 mph IAS, slackening perhaps to 120 mph over the boundary. Holding off is easy but the forward view from the back seat more or less disappears as soon as the nose is held up. The view, however, is no worse than from, say, an F4U.

The approach, generally, affords the instructor a better view than from the Meteor. Instead of having to share the front pilot's windshield and look in the narrow gap between his ear and the pillar you have the whole of his side panel to yourself in the back seat and this affords a view of the edge of the runway—just where you want to look.

Adding it up, the Shooting Star is an outstanding combination of performance with practicability. It is a gentle aircraft to fly with a wide speed range. The speed extremes, stability and general handling all mark this design as a model of good behavior.

The only disadvantages were an aileron somewhat lacking in precise lateral control due to its lightness; the view from the back seat of the trainer is restricted, and the instrument layout, though compact and well arranged, is still not quite perfect.




THE GRAPH on the left shows the astounding rate of roll and the one on the right the dive brake efficiency of the Lockheed F-80 and TF-80. The figures also apply to the F-94 Night Fighter.

**Turbo-C-47 Freighter**—First of the Douglas C-47 transports powered by two Rolls-Royce Dart 1,400-hp turbo-props has started flying and three freighter aircraft are to be operated with British European Airways to help gain operating experience with the engine. The Dart has a warranty of 1,500 hours and a tentative overhaul period of 500 hours. Rolls-Royce offers five overhauls for the price of one engine—thus continuing piston engine practice.

# Convair's Civil Turboprop Flying Boat

## . . . Proposed XP5Y-1 Offspring

A 140,000-lb. turboprop flying boat transport which is being considered by Convair and the major airlines would bear a close resemblance to the Navy's XP5Y-1 whose first flight was made at San Diego on April 18. The practicability of using fast boats on some routes turns largely on technical and international questions about the mutual upkeep of bases. These lie outside the scope of this article which is concerned only with the type of advanced thinking aerodynamically and hydrodynamically as a result of the very high output offered by the Allison T-40.

This unit falls in a power bracket which has been very shrewdly chosen as necessary for a whole range of different aircraft and in this case the flexibility obtained by using different combinations of engines (eight for takeoff, six for climb, four for cruise and two for holding) means lowest specific consumptions from the engines which are turning.

### Can Stay at Sea

The hull is characterized by its narrow beam of 10 feet which is designed to ride an eight-foot sea and the bow wave is reduced so that a prop water clearance of only five feet allows the boat to sit much lower in the water and its overall dimensions can be more regular aerodynamically.

This means that the Navy's boat can go to sea with the fleet and remain there. An LSD can "mother" several of the Convairs and thus avoid spending two-thirds of their flying time traveling to and from their bases as is necessary with land-based aircraft. And the Convair can carry much bigger loads than any ship-borne aircraft. The punch of a weapon like the XP5Y-1 is about that of a destroyer and it is clearly a more mobile, effective and economical way of using sea power.

### Clean Hull Interior

Many of the military features have a commercial value. The long hull without internal obstructions enables the crew to live aboard comfortably for long periods and means that 100 seats can be mounted without any modifications other than moving the flight deck from its present position into the nose after clearing away the forward gun mountings. Another version with two decks could be built in which the top line of the hull follows the leading edge of the wing instead of dropping down from it in the single-deck aircraft.

The hull is not pressurized at present but for passenger work it would need to be. This could be done by beefing up the top arch members of the hull. The lower part of the hull is already, in effect, pressurized and so this would not be an expensive modification, provided a moderate differential is chosen

Fuel tankage of 8,000 gallons is ample for North Atlantic operation using the current reserves.

The wing has one-degree angle of aerodynamic twist and four degrees of geometric twist. The profile alters spanwise through three different airfoil sections. But the twist is not obtained by, so to speak, joining up these three sections with straight lines but it has a progressive merging of the sections with their own advantages along the span. It is therefore quite a classic wing and this is clearly evident if it is examined from the side view.

The wing is arranged to sit on the hull with a five-degree angle of attack. This allows the hull to fly in streamline at cruising speed, and makes the hull manageable at low speeds. The hull has a 23° angle of dead rise which will be recognized as one capable of taking high water speeds. The wing has a strange job to do because the boat with a power loading of about four lb/hp has the characteristics of World War II fighters and has a theoretical climb of 56° (which is limited to a more dignified figure for a 60-ton boat owing to limited booster pump capacities).

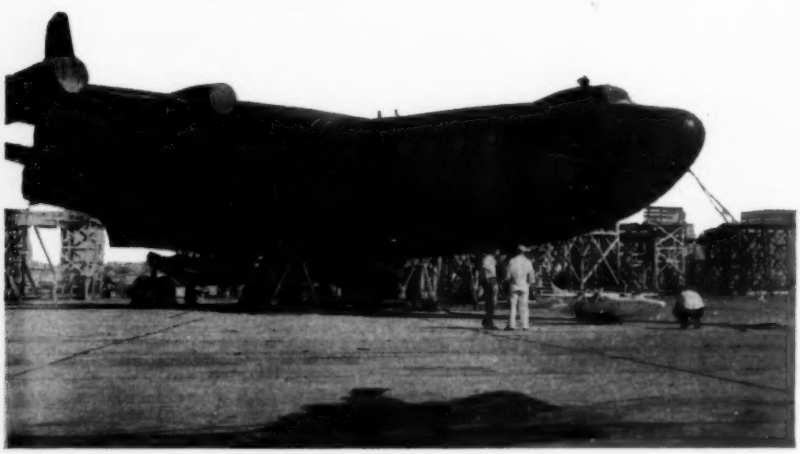
Convair has used a neat device which students of German technique will recall introduced on the Blohm and Voss boats of making control runs of aluminum tubes and pulleys with sharp changes in direction taken by bell cranks. Convair, however, was shy of using them on the engine controls like the Germans. Convair has not resorted to power operation on the B-36 and so the use of servo tabs for the main controls of a small aircraft like this was child's play—comparatively speaking.

### Engine Attachment

The Allison engines are buried (and lost) inside the wing and attached to the rear of the rear spar which is situated forward at 45% chord. The front spar is at 15% chord and the two spars, the skin and the nose piece combine to form a torsion box which also takes the bending loads on the wing. The engines would therefore have to be supported aft from them.

The rest of the wing behind is of lighter construction with only a fury strut for hinging the ailerons and the slotted flaps.

AiResearch makes a 60 hp auxiliary gas turbine and a tapping from the compressor of this engine leads pressure air to small bleeder units which can be used to start one unit in each of the paired nacelles. The other engine can be started through a clutch or, to save wear on the clutch, started



**Civil Design Study—** Two civil adaptions of the Navy's XP5Y-1 turbo-prop 140,000 flying boat are being studied by Convair. One single-deck version (projected above as it might look) shows the flight deck pushed forward using the present hull design. Another two-deck transport would have the lower hull unchanged but the top deck would run straight from the top surface of the wing instead of dropping down from it and the flight deck would be faired into the nose contour.

by the bleed and clutched in when it reaches its running speed. These engines are intended to spend all their running time at the condition of lowest specific—which is as close to 100% output as possible. In fact, about 85% power can be used continuously. So after the engines are started they all turn up at once to 85 per cent power.

To start moving on the water, the throttles when pushed forward will ease the Aeroproducts contraprops off their zero pitch and give a few degrees of bite for steering purposes. There is a flight idling position, but this is much too high to be used on the water and would push the boat along at about 80 knots. To shut down the engines they can be feathered.

It has not so far been found possible to compromise high and low speed requirements of the propeller blade roots. To avoid having a blade root whose angle of attack would act against the line of thrust at high speeds Convair and Allison have built a spinner much larger than is dictated by the need to fair off the hub mechanism. Dare we suggest an independently variable root pitch? The penalty of a large spinner is not large in terms of parasite drag.

### Narrow Float Design

The design of floats is typical of the hull. They are long and narrow and have a four-degree angle of attack. The narrow beam will minimize the risk of carrying off a float in a touch-down first on one float. With a wide beam even if the float does not actually get torn off it will throw the boat sharply onto the other float. The narrow beam will avoid these two tendencies.

Convair has considered the use of retractable floats to fit into the concept of high performance but their experience during the war with the patrol boats made it clear that the possibilities of failure due to ice physically preventing retraction, and other reasons, more than offset the small speed increase, particularly as a good aerodynamic float spells a rather miserable hydrodynamic performance.

So Convair decided to design a really smooth float which remains fixed and is the best compromise between the conflicting air and water requirements. Anybody can see that the final result sitting on a cantilever strut is a creditable achievement.

The tail unit calls for no particular comment and involves no novel features. Convair obviously believes in sticking to accepted practice unless there is good reason to change. The large size of fixed and moving vertical surfaces has been dictated by the enormous asymmetric power obtained during flight with both pairs of engines on one side off.

# Design Trends

**By Richard G. Worcester**

THE CLAIMS which have been made about the British technological lead in gas turbine research and development require close examination because the qualities which constitute a lead in 1950 are not the same as those which proved decisive immediately after the war. In 1945 and 1946 all efforts were being made to develop a practical engine of 3,000-4,000 pounds thrust, and research into engines of 5,000 pounds thrust was a top priority. The large numbers of Lockheed F-80, Republic F-84, Vampire and Meteor equipment which have now been built and pushed into service all over the world are a testimony to this work. The success of the U. S. Axial and the British centrifugal jets are also a reflection of the achievements during the same period.

**Durability Needed.** In 1950, however, the quest for greater output has not become a primary goal and emphasis has shifted to the need for greater durability and, for civil turbines of all kinds, a reduction in component costs coupled with the use of improved production methods. The requirement for a new family of jet engines with thrust figures of up to 10,000 pounds is conditioned more than ever by the fuel consumption. Specific consumptions are too high even at 1 lb./lb. th./hr. It is important also to avoid the use of materials mined from countries which lie outside the broad network of Atlantic Pact defense. International standardization is bedevilled by the reluctance of the British to use materials like nickel which are obtained from dollar sources. In Britain and in this country the aim is to build a jet engine without cobalt, and the British are trying to equal present performance without nickel, columbium and titanium.

**Refinement of Design.** There is everywhere a movement towards reaching new levels of efficiency by refinement of design following a greater fundamental understanding of the gas turbine rather than by asking for higher strength (and more expensive) alloys. Material makers are finding that designers are not asking for the finest materials but trying to improve thrust with existing alloys already in quantity production. This shows the gas turbine is passing out of its infancy and entering a phase which will be marked by its use in a wider range of civil and military types of aircraft. After years of sunny optimism it is perhaps fair to say that the cost of a new turbine engine may amount to some $15 million—not appreciable less than the initial outlay on a new piston engine.

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*Lockheed's classic design, the P2V, appeals to our mathematical instincts. Its wing chord of 10 feet, wing span of 100 feet, wing area of 1,000 sq. ft. and aspect ratio of 10 have all the perfection of the Cheops Pyramid. On sheer performance it may be validly held that this is the most efficient aircraft ever built and, with the trend towards gas turbines with and without propellers, the record is likely to remain a historic milestone until it is put into perspective by some 500,000-lb. global nuclear steam-turbine aircraft.*

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What is the next phase in fighter and bomber design? Both Categories of aircraft should, perhaps, be tailored to use an interchangeable powerplant. Two axial engines with a thrust of 8,000 pounds and capable of being increased to 10,000 pounds each could be accommodated in a slim fuselage, if staggered slightly. Both could use the same annular intake in the nose and both have a common tailpipe. The level speed depends on the thrust, say around M1.6. The same engines, if spread along a delta wing bomber three on each side, and with a gross weight of around 190,000 pounds could cruise at about M 0.92. An alternative powerplant for the bomber or transatlantic transport would be four engines of 15,000 pounds thrust each, similar to a de Havilland project which was studied some years ago. The diameter of such an engine is close to 5 ft., so assuming a 10% thickness/chord ratio wing is chosen, the chord of 50 feet in the vicinity of the power units would fit geometrically into the delta pattern and permit complete submerging of the engines, despite the "thin" wing.

# ATA's Engineering-Maintenance Conference

By WILLIAM D. PERREAULT

EVERY AIRLINE was rich with engineering and maintenance talent one week last month. The time was the week of April 3. The occasion was the Air Transport Association's annual Engineering and Maintenance Conference at Kansas City, an occasion that attracted some 565 representatives of airlines, manufacturers and distributors. They were there to discuss the problems of the operators and to seek out solutions where possible.

Generally the conference does not generate news but, rather lets each airline know what the others are doing about problems which often prove to be common among them.

However, several important news items did come out of this year's conference: (1) Stanley Shatto, vice president-operations, Western Air Lines, was chosen chairman of next year's conference, (2) Chicago was picked as the site of the 1951 conference, (3) AMERICAN AVIATION'S first annual Engineering and Maintenance Award was presented to Robert L. Fulton, an Eastern Air Lines lead mechanic, and (4) an important new experiment in establishment of overhaul times was decided upon.

Shatto

The latter item will undoubtedly have the most long-standing affect on the airlines. On the final day of the three-day conference, CAA and representatives of the airlines agreed upon a nine-month trial program to be conducted by TWA, American and United Air Lines using a new formula for the establishment of overhaul times on such important items as engines, propellers and accessories.

## Nine-Month Trial

At present the airlines and CAA agents are governed by CAA Safety Regulation Release 209 in establishing the overhaul times on items covered by the airline operations certificate. This release establishes the maximum increase in overhaul times that can be granted at one time, the procedures to be used in securing time extensions and other guiding criteria. For some time the airlines have felt that SRR 209 was arbitrary and unrealistic.

The nine-month service test by the three airlines, AA, UAL and TWA, will permit the lines to advance or otherwise modify overhaul times on the basis of accumulated data exclusive of SRR 209's limitation. Working with the local CAA agents, the airlines will develop experience on

Below: Clarence Wilde, Northwest Airlines, and J. F. Martin, American Airlines.

AMONG 565 industry representatives at ATA's Kansas City conference were, left to right, Redden, Walter Kidde & Co.; Otto Kirchner, American; I. J. Hammill, Kidde; G. C. Younie, Braniff; A. Hobelmann, Kidde; Richard Ault, EAL, and Edward Schmick, TWA.

ATA CONFERENCE delegates included Elmer Daugherty, left, Walter Close, Eastern, third from left, J. T. Hendron, Pan American; C. W. McAllister, Sinclair, and L. D. Davis, Turco Products, extreme right.

SHARING DINNER table at the conference were John Collings; TWA; Clark Stebbins, Goodrich, third from left; A. M. Sutherland, TCA; J. S. Pedler and Ed Rodgers, Goodrich.

Top left: Robert Fulton of Eastern Air Lines shown receiving American Aviation's Engineering and Maintenance Award from Wayne W. Parrish, editor and publisher. Top right: Aubrey Keif, The Texas Company, toastmaster of the conference dinner, brings a smile to the face of Ray Dunn, TWA, who was conference chairman. Below: chairmen of the nine sessions of the conference, left to right, W. W. Davies, UAL; R. E. Geror, NWA; H. W. Holzapfel, WAL, J. G. Borger, PAA; Marvin Whitlock (inset), American; G. C. Younie, Braniff; F. A. Humphrey, TWA; R. L. Anderson, C&S, and R. R. Stark, EAL.

which to base a more realistic approach to this vital problem.

First operation under the new trial test probably will be started in early May. Each airline will work independently to develop alternate methods of computing times.

The decision to move the annual conference to Chicago next year was dictated by the record-breaking attendance which filled the meeting rooms and halls to capacity. Under the capable direction of the conference chairman, R. M. Dunn of TWA, the 565 delegates carried on one of the most successful meetings of recent years, reflecting the experience gained in previous years.

## Migrating Delegates

No small credit goes to the section chairmen, the men who acted as moderators of the nine individual sessions. With three sessions going on simultaneously, there was a constant migration of delegates from one conference room to the next as airline representatives attempted to be on hand in each session while questions pertaining to their own operation were discussed. Despite this mass movement throughout the meetings, smooth session operation was assured by the use of effective public address systems in each room with multiple microphones spotted at the speakers' tables and through the audience.

Limited travel budgets and limited departmental personnel reduced the number of airline representatives, requiring those men present to be more versatile than before.

A check of the attendance list showed that only 184 attending were airline personnel, 17 of these from foreign airlines. Among the other major categories were 187 representing accessory manufacturers and suppliers, 35 prime aircraft manufacturers' representatives, 29 oil company people and 20 members of CAA and CAB.

## Clarified Confusion

While budgets kept representatives of some lines at a minimum, there were many factual proofs of the savings made possible by the meeting.

One of the more outstanding examples related to a propeller limitation being used by two airlines. These lines had scrapped in the neighborhood of 50 propeller blades because a release establishing propeller limitations at overhaul operations was not entirely clear. These airlines had taken the propellers out of service assuming they had exceeded allowable minimums. Clearing up the method of measurement to be used will enable these lines to put the blades back in service.

While this is an extreme example of the after effects of the annual engineering and maintenance conference, it is a sample of the ways in which every participating airline benefits. Too often the engineers and maintenance men of one airline are spending time and money working out a solution to a problem which another line has already solved. The

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conference highlights there conditions and eliminates them.

## Troubles Resolved

Last year the **electrical system troubles** being experienced by all the airlines seemed beyond solution. There was a cry for some common standard for manufacturers and airlines alike. This year the Aircraft Industries Association's electrical standards volume had answered this need. The learning curve of the airline maintenance men was starting to level out and it no longer looked hopeless.

Training and time has solved many of the problems. The airlines were more ready to accept aluminum wire in the heavy gage installations, although a few lines remained antagonistic about the lighter metals.

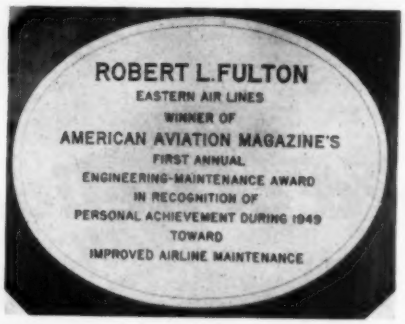
Electrical specialists from Boeing, Lockheed, Douglas and Martin were on hand in the electrical sessions to add their experience to that of the airlines. Overvoltage protective equipment received considerable attention and one airline, American Overseas, indicated it is about to start service testing of either the General Electric or Jack and Heintz overvoltage control.

There were indications by the airlines that they would start using the AIA standards in new installations and in repairs where practical. Eastern indicated that the Martin 4-0-4's would use this basic design with minor deviations.

## Circuit Breaker Tests

One of the more prominent and unsolved problems remained the testing of circuit breakers. While the AIA standard adopts certain sizes of breakers for each wire gage, there remained confusion and disagreement as to how these units should be tested.

Probably the most **important development in engines** was the decision to work out new criteria for extending overhaul times (above). The impact of this change was highlighted when Ralph Geror, manager of maintenance




for NWA, introduced the cost record of NWA engine overhauls as engine periods were extended.

When NWA started operation the P&W R-2800 engine at 700-hour overhaul periods the cost of overhaul of the bare engine per hour of flight was $7.74. When overhaul time moved to 800 hours costs dropped to $6.18, at 900 hours it was $5.25, at 1,000 hours $4.87, at 1,100 hours $4.18, at 1,200 hours $3.93 and at 1,300 hours $3.60.

NWA's P&W R-2000 cost $3.25 per hour of flight to overhaul when times were set at 1,000 hours, $2.97 at 1,100 hours, $2.84 at 1,200 hours, $2.61 at 1,300 hours, $2.34 at 1,400 hours and $2.31 at 1,500 hours.

Because of these major reductions in cost, any new criteria to permit a realistic method of controlling extensions should result in major economies.

## Engine Components Split

NWA has a program underway of service testing five R-2000 engines in which the power section is operated 1,500 hours—one overhaul period—and the nose and accessory sections were operated two overhaul periods, or 3,000 hours. Three of the five engines have completed their runs short of the 3,000 hours but not because of troubles with either of the sections under test.

The P&W R-4360 engine of the Boeing Stratocruiser was one of the major topics of discussion during the meeting. The airlines operating this equipment are authorized for overhauls periods ranging from 600 to 900 hours but two lines are giving the engines top overhauls at 300-hour periods. In general the lines are cruising the engine at 1,750 brake horsepower.

The major problem appears to be one of cooling. It is difficult if not impossible to pinpoint the troubles responsible for failures since they seem to spread through most of the engine components. The airlines had anticipated use of higher cruising horsepower, about 1,900, and 1,750 bhp find the airplane performance sharply limited.

By operating with cowl flaps open in cruising, United Air Lines is alleviating the cooling problem and consequently encountering less engine trouble, but this is accompanied by an airspeed penalty of about 15 mph.

## Non-Inflammable Fluid

The major trend in 1949 **in the field of hydraulics** was the increased interest in and preliminary tests of non-inflammable hydraulic fluids. All the lines showed interest in these fluids but the adequacy of the present specifications governing these fluids was questioned.

Among the tests now underway are those in the supercharger installations of all of United Airlines DC-6's and a complete system test in a UAL Douglas DC-4. Both of the UAL tests are with Monsanto Skydrol. TWA is using Hydrolube U-4 in the cabin superchargers of the Constellation. Hollingshead representatives told the airlines it would soon introduce a fluid, developed under a Navy contract, which shows considerable promise.

**The ignition session**, under chairmanship of R. L. "Doc" Anderson, highlighted the service advantages of the Scintilla low-tension ignition system which is now standard equipment on P&W R-2800 and Wright 3350 engines. Erosion rates are much lower with overhaul times of 500 to 600 hours being experienced.

Limited experience has also been obtained on the General Electric high-frequency system and tests will soon be conducted by American Airlines and National. Major concern regarding the GE system seemed to be the high initial plug cost—$8-9 as compared to $1.50-4.00 for present plugs. The estimated plug life of 1,200-3,000 hours will offset this initial disadvantage if it proves itself in service.

## Engine Analyzer

The airlines gained considerable experience with the Sperry engine analyzer during the past year and it appeared that it would be a necessity with larger engines for optimum service. A definite reduction in off-scheduled plug removals was experienced by the users.

With the increasing use of progressive overhaul by the airlines, experience was showing difficulties in scheduling aircraft to permit overhaul schedules to be maintained.

As usual, **cargo compartment flooring** was still presenting problems. Because the surface will not stand high local stresses, sandwich-type flooring has proved "eminently unsatisfactory." Eastern Air Lines will use a honey-

**Flying Colors**—This is the new paint scheme which Capital Airlines has adopted for its fleet of Douglas DC-4's. Prominent features are the Orlando Red used in the lettering, insignia and stripes, the white top and "square windows." The DC-4 is generally distinguished at a glance from the DC-6 by its oval shaped windows but the new paint job effectively hides this difference. Capital's earlier paint scheme was comparatively drab.

comb flooring with a surface of one-eighth inch Consoweld in the Martin 4-0-4. Consoweld is a laminated paper impregnated with plastic and is expected to hold up for 8,000 hours service.

Western Air Lines' H. W. Holzapfel, structures chairman, told the group that WAL expects to use extruded magnesium for cargo flooring. This flooring, manufactured by Dow for Western, is ⅝ inches thick and comes in 5.3-inch widths. It commonly is used in trailer trucks.

### Five Recaps Per Tire

Western and Pan American's Pacific division are **recapping tires** as many as five times while most lines are limiting recapping to two. The discussions developed that there appeared to be nothing wrong with this practice if the casing proved mechanically sound. The practice of applying extra rubber above original tire weights was condemned and a factory ruling against recapped tire weights exceeding original weights by 3% or more is likely to result.

**Problems with steel propellers** are dropping but only as the weight of the propeller is increased. Little weight advantage of the steel blade is expected when it is fully developed because of this trend.

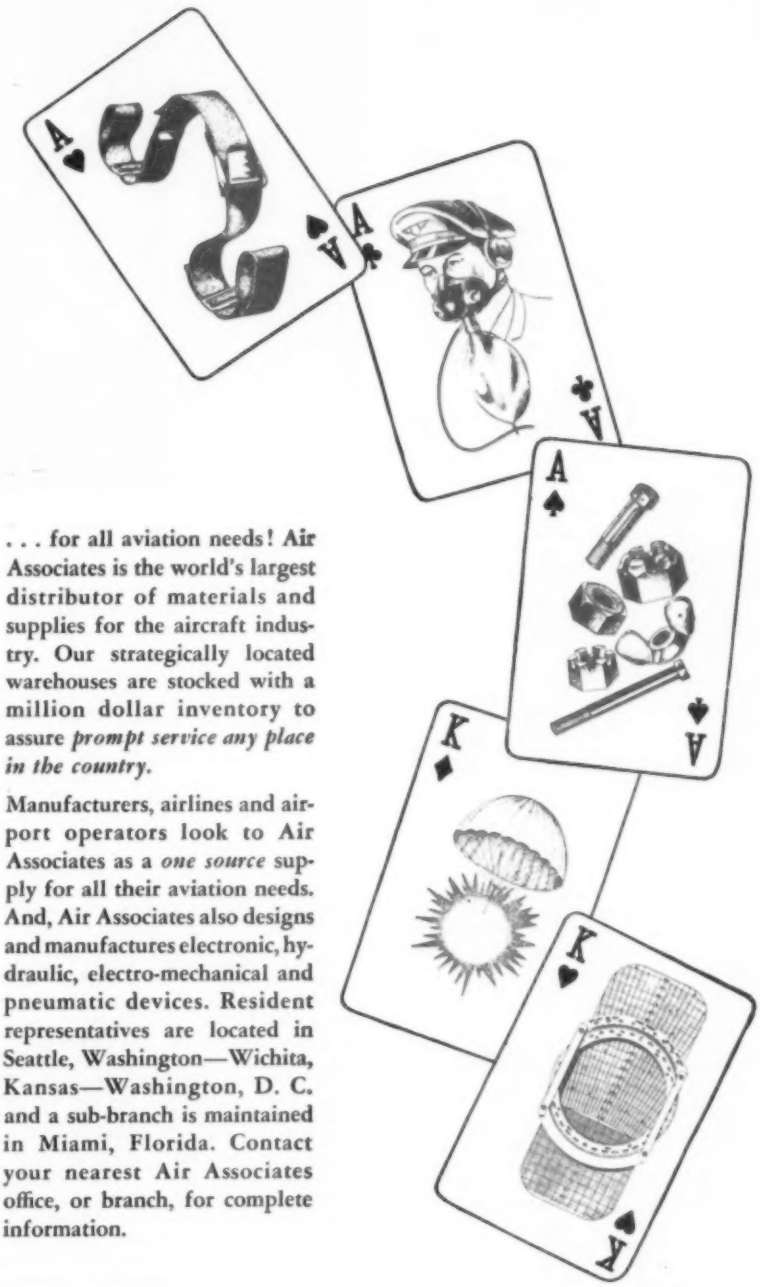
In the propeller session, under the guidance of EAL's Robert Stark, it was developed that blade tapping is proving effective in locating voids in the filled portion of the hollow blades. Apparently voids sometimes occur in the

## Daily Plane Utilization

### Domestic

| | | Jan. | Feb. |
|---|---|---|---|
| American | 2 eng. pass. ... | 3:52 | 4:06 |
| | 4 eng. pass. ... | 7:53 | 8:24 |
| | cargo ..... | 3:27 | 3:05 |
| Braniff .. | 2 eng. pass. ... | 6:11 | 6:27 |
| | 4 eng. pass. ... | 6:09 | 6:26 |
| Capital .. | 2 eng. pass. ... | 6:28 | 6:48 |
| | 4 eng. pass. ... | 7:27 | 8:25 |
| | cargo ..... | 3:03 | 3:08 |
| Carib. ... | 2 eng. pass. ... | 3:08 | 3:22 |
| C & S .. | 2 eng. pass. ... | 7:21 | 8:08 |
| | 4 eng. pass. ... | 8:39 | 8:34 |
| Colonial .. | 2 eng. pass. ... | 4:11 | 2:41 |
| | 4 eng. pass. ... | 2:47 | 5:34 |
| Contin't'l. | 2 eng. pass. ... | 6:06 | 6:13 |
| Delta .... | 2 eng. pass. ... | 6:35 | 6:50 |
| | 4 eng. pass. ... | 6:32 | 6:44 |
| | cargo ..... | 5:59 | 6:32 |
| EAL ..... | 2 eng. pass. ... | 9:30 | 9:44 |
| | 4 eng. pass. ... | 9:28 | 10:01 |
| | cargo ..... | 7:02 | 7:14 |
| Hawaiian. | 2 eng. pass. ... | 4:20 | 4:18 |
| | cargo ..... | 1:46 | 1:53 |
| Inland ... | 2 eng. pass. ... | 8:57 | 9:42 |
| MAC ..... | 2 eng. pass. ... | 6:36 | 7:03 |
| NAL ..... | 2 eng. pass. ... | 6:23 | 6:46 |
| | 4 eng. pass. ... | 7:42 | 8:52 |
| | cargo ..... | 1:05 | 2:13 |
| NWA ..... | 2 eng. pass. ... | 3:59 | 4:01 |
| | 4 eng. pass. ... | :51 | :23 |
| NWA .... | 2 eng. pass. ... | 6:02 | 6:45 |
| | 4 eng. pass. ... | 5:40 | 5:20 |
| | cargo ..... | 3:31 | 3:13 |
| Trans Pac. | 2 eng. pass. ... | 2:08 | 1:52 |
| TWA .... | 2 eng. pass. ... | 5:45 | 6:04 |
| | 4 eng. pass. ... | 8:16 | 8:26 |
| | cargo ..... | 4:29 | 5:05 |
| UAL ..... | 2 eng. pass. ... | 4:05 | 4:27 |
| | 4 eng. pass. ... | 6:21 | 6:25 |
| | cargo ..... | 3:01 | 3:16 |
| WAL .... | 2 eng. pass. ... | 5:29 | 6:13 |
| | 4 eng. pass. ... | 3:35 | 4:00 |


# YOUR FULL HOUSE



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compound used to give the blade stiffness. Attempts are to be made to inject compound into the voids via the original blade openings. The difficulty appears to occur only in the outer 36 inches of the blade, particularly in the 2J-17's used on the Boeing Stratocruisers.

## Prop Tip Scuff Pads

Eastern Air Lines related how it had received approval for repair of the Hamilton Standard propeller tips by removal of the outer inch and replacement with fitted micarta. This important development may ultimately provide for a replaceable scuff pad with resulting reduction in blade changes.

It was also developed that Western Air Lines has found it practical to metallize propeller blades on which the zinc has peeled. This is being done for Western by the Metallizing Corp. of America.

Hamilton Standard representatives told the conference that it is considering a new installation which will eliminate difficulty now experienced with feathering Hydromatic propellers in cold weather.

This would be accomplished by providing two new switches associated with the propeller blade. Once the blade reached the feathering range one of these switches would provide an alternate ground circuit for the cockpit holding solenoid until the blade reached a position about 5 degrees from the full-feathered position. At that point the second switch would disconnect this circuit and let the normal circuit functions control the operation.

## Tank Resealing

As in other postwar conferences, **fuel tank resealing trouble** occupied a sizable part of the session on fuel and oil systems, this year under the chairmanship of Braniff's G. C. Younie. Braniff related how bids submitted for a reseal job on a Douglas C-54 ranged from a low of $7,000 to $24,600. Estimates indicated a minimum equipment cost of $7,000 to $10,000 to permit resealing a C-54 with B fuel system and a minimum of $10,000 to $11,000 for labor, parts, etc.

Earlier reseal jobs have resulted in 4-5 years' service and expectations are high that current resealing may provide 8-10 years' service life. The airlines are now faced with the decision as to whether they should deseal and start from scratch or continue extensive patching. This appears to be a matter of individual airline operating requirements.

Minnesota Mining's sealants appeared to be providing the best service experienced but is said to be difficult to handle. TC-48 is lighter and cheaper and has been in use to some degree for about two years. Some experimenting has been done with translucent sealants which permit the detection of leaks during resealing but experience is limited. The cohesive and adhesive qualities of carbon black in the sealants work contrary to development of successful translucent materials.

Experience of the Douglas DC-6 and Convair Liner indicate that the integral fuel tanks are giving no trouble yet and not expected to. The bladder cells are also working out satisfactorily. Major fuel system troubles are with valve seals and water condensation in hermetically sealed motors.

**Monthly Award**—Braniff Airways has initiated a "Man of the Month" award in connection with its trouble-free operations campaign. Senior mechanic J. C. Barrett (right), is shown demonstrating the device which won him the first man of the month award to W. T. Maxwell, director of maintenance and engineering. His gadget makes it possible for the stewardess to repair the reclining mechanism of seats in the DC-6 so that the seat can continue to be used.

## 35,000 Tube Failures

**The instrument session,** under the direction of American Airlines' Marvin Whitlock, emphasized the importance of the ruggedized tube program being sponsored by Aeronautical Radio and several manufacturers. In the last year United Air Lines experienced 35,000 tube failures. This is particularly critical in the autopilot and similar control circuits. Ruggedized tubes cost 3-4 times as much as regular tubes but appear, by laboratory tests, to have 6-10 times the service life.

Manufacturers of tubes have not been too interested in ruggedized tubes because of design and production problems. Rate of rejection on newly manufactured ruggedized tubes ran as high as 60% in the early stages. At present the available ruggedized tubes are not numerous enough to fill all the needs, particularly in control circuits.

Service experience with the Minneapolis-Honeywell capacitance fuel gages appears quite satisfactory. There also appears to be greater acceptance of electrical gyro instruments by the flight crews, a matter which had previously caused some concern.

Unlike most of the sessions, the **heating, ventilating and pressurization session,** under W. W. Davies of United, delved considerably into basic design problems. Even distribution continues to be a problem as do the fans and blowers used to assure this distribution. The airlines are finding fibre-glass ducts of value because of their ease of fabrication, light weight and simplicity of repair.

## Among the Suppliers

**Aero Supply Manufacturing Co.,** Corry, Pa., has designed and tested, but is not yet producing, a rotary solenoid air valve to be used in conjunction with turbo pumps for jet powerplant afterburners. New items designed and now in production are magnetic electro fuel level float switches and high pressure micro filters . . . **Airborne Equipment, Ltd.,** a division of Carruthers and Fernandez, Inc., newly organized designers and manufacturers of aircraft components, Santa Monica, Calif., has appointed **Harold E. Webb,** formerly with Lockheed and Douglas, as sales engineer

**Lear, Inc.** has appointed **Walton B. St. John** as sales manager of its Aircraft Radio Division at Grand Rapids, Mich. He was formerly with Piper Aircraft Corp., Fairfield Engine & Airplane Corp., and the Aeronca Aircraft Corp . . . **Foote Bros. Gear and Machine Corp.,** Chicago, Ill., has appointed **Associated Air Service** of Dallas, Tex., to represent the Precision Gear Division in the sales and service of A-Q (aircraft quality) gears, actuators and power units in Kansas, Oklahoma, Texas, Missouri, and Arkansas.

St. John

**General Electric's** recently established twelfth Apparatus Department sales district, with headquarters at St. Louis, will be known as the Mid-States District . . . **J. E. Leonard** has been promoted to district manager, Aviation Products Division of the **Goodyear Tire and Rubber Co.,** with headquarters at Dallas, Tex. . . . **C. H. Bruns** has been transferred to Manufacturers Sales Department at Kansas City, and **R. H. Hill** has been assigned to the Akron office in charge of Goodyear's contacts with the light plane industry.

**E. Allan Williford,** former vice president of General Aniline and Film Corp. and general manager of the Ansco Division, has been named vice-president and general manager of the **Link Aviation** organization in Binghamton, N. Y. Mr. Williford succeeds **George W. Emerson** who is retiring from active management of the company but will be retained in a consulting capacity . . . **The new offices of the Lear International Export Corp.** are located at 9 East 45th Street, New York City . . . **Tinnerman Products, Inc.,** has opened a new district office at 7614 Wydown Boulevard, St. Louis, Mo., with **Carl F. Marcusse** as manager.

# Extra Section

**By William D. Perreault**

AMERICAN AVIATION'S editorial staff is constantly on the go. As a result we seldom have a full complement at one place at any given time, even in our main offices in Washington. It was a genuine surprise last month when ten of our staff members showed up for CAA Administrator Del Rentzel's press conference and luncheon. By contrast, at one time last month three of us were in Kansas City for the ATA Conference, Dick Worcester was on the west coast making a tour of aircraft plants there, Len Eiserer, Dal Long and Eric Bramley were in Harrisburg, Pa., putting together our special air transport progress issue and Jim Haggerty was in Philadelphia for the IAS helicopter forum.

•

*Sparks plugs continue to lead a maligned life. No matter what engine trouble seems to occur, it's a good excuse to change the spark plugs. While the Sperry engine analyzer appears to reducing unscheduled plug removals, airlines without this special equipment might also get results. One operator at the conference related how plug replacements were drastically reduced when a ruling was circulated requiring the mechanic to personally take all prematurely removed plugs to the foreman and explain why they were removed.*

•

TWA undoubtedly has more bearded mechanics than any other airline in the business. In Kansas City, where TWA's overhaul base is located, they are celebrating the city's 50th anniversary. In connection with the occasion, and apparently to raise funds for the celebration, they have imposed a fine on shaving. Shaving can only be accomplished if the license has been purchased. A good many of the local men have turned to raising beards instead. We assume the fellows in the welding shop are kind of forced into submission. It presents a new industrial hazard for this day and age.

•

*Walter Kidde & Co. has redesigned its visual smoke detector and arrived at a very simple design which is much more sensitive than the earlier layout. The unit is housed in a box about five inches long, one inch wide and four inches high. A darkened rectangular opening is provided on one end of the box. When smoke is drawn from the compartment in concern and through the detector (by applied suction) the rectangular opening gives a direct and clear indication of smoke. No moving parts are used and only the simplest electrical circuit is needed.*

•

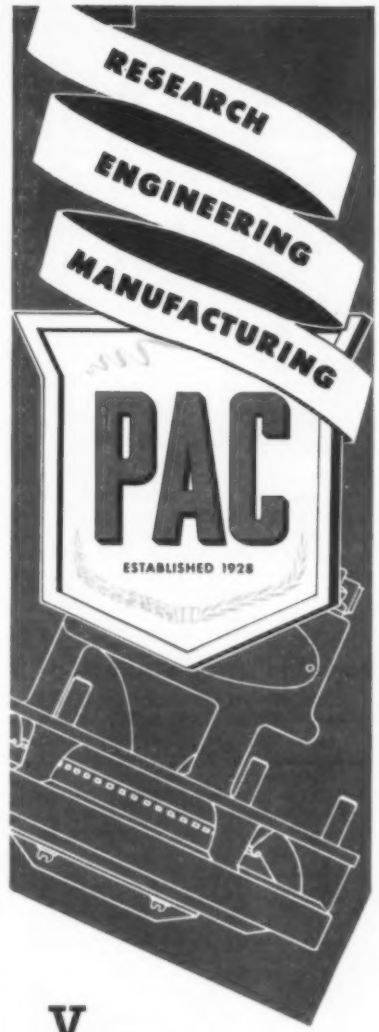
At each of the annual meetings we've attended in the past few months scientists, engineers and maintenance men eventually turn to the topic of flying saucers. No one is quite willing to let on that he believes there is something to the saucers. Yet no one is quite willing to dismiss them. If one lends a sympathetic ear he finds plenty of arm-chair saucer experts willing to tell their version of where the saucers are coming from and what they are.

•

*Ansul Chemical Co., Marinette, Wisc., has available a periodic inspection chart for use in keeping accurate records on the fire extinguishers used around hangars and other industrial plants. It provides space for 26 inspections of up to 38 extinguishers with a space for the building number, floor, extinguisher type, extinguisher number, purchase date, and a simple code for periodic inspection, annual recharge, etc. It should be a helpful tool for the men responsible for extinguisher checks in your hangar.*

•

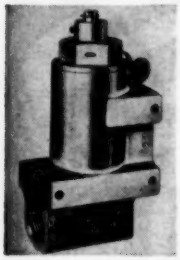
We were particularly pleased at the wonderful cooperation extended by the ATA conference secretary, Al Dallas, and conference chairman, Ray Du[illegible] of TWA, in making our annual maintenance and engineering award presentation a success. They made all the arrangements to fit the presentation into their regular banquet program and made a decided contribution to the award's meaning by the manner in which they integrated it into one of the industry's fastest growing annual meetings.


Your blue print for operation efficiency should be on our drawing tables now. If not, let's discuss your problem at the earliest moment. PAC research, engineering and manufacturing has met the challenge of aviation for 20 years. Call or write our manufacturing division . . . Now!

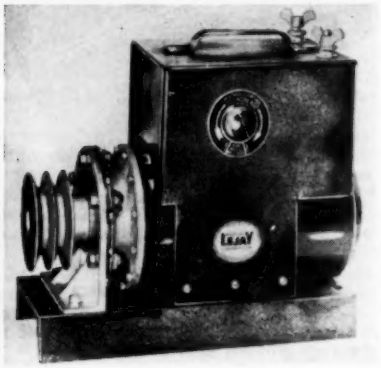
## Hydraulic Relief Valve

**Hydraulics Division, Pantex Mfg. Corp.,** Pawtucket, R. I., has announced a new cartridge-type hydraulic relief valve meeting Specification AN-V-1b and available for pressure settings ranging from 100 to 5,000 pounds psi. The manufacturer claims the new valve opens and closes within a 7% differential and that it is silent in operation. The design is said to eliminate wire draw and provide high volume flow at all pressures. Temperature range of the valve provides for operation from minus 65 degrees F. to plus 160 degrees F. The design makes it possible to replace the entire operating mechanism as a unit without breaking the fluid carrying lines. An accessible screw is provided for quick pressure adjustments.



## Portable Arc Welder

**Lejay Manufacturing Co.,** 2908 S. Emerson, Minneapolis 8, Minn., is marketing a portable arc welder operating on a Bendix P-2 generator and usable for work requiring 200-300 amps capacity. It will, according to the manufacturer, handle loads up to 400 amps for short periods. Total shipping weight



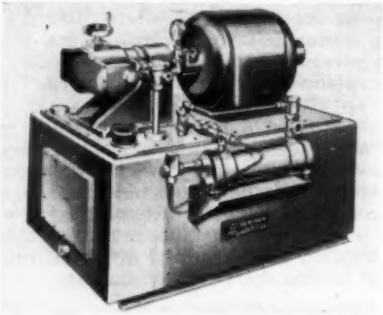

including accessory kit is 95 pounds. Models 200 requires a 7½ hp electric power supply or a 10-15 hp gas drive. Running speed is 5,000 rpm, welding range in amperes is 0-300 and normal welding amperes rating is 0-225. Capable of continuous welding, up to four hours, at 200 amps. Normal welding voltage up to 32 volts. Model 200 provides welder minus power drive and sells for $117.50 while model 203 includes a Wisconsin Heavy Duty two-cylinder air cooled engine rated at 13½ horsepower. The model 203 weighs 375 pounds as shipped and sells for $299.

## Grounding Reel

**Reel Products, Inc.,** 10700 Broadway, Cleveland 5, O., is marketing a series of grounding reels for grounding static charges on fuel servicing equipment. The series 200 reels are equipped with 20 feet of 3/32" diameter phospher bronze cable and one-foot phospher bronze pigtail to fasten to the ground connection. A 5/8" grounding rod is provided with the grounding reel for field installations. The cable is paid out or retracted as desired with a slight constant spring tension to prevent tangled cables. All parts of the reel are cadmium plated. For overhead installations stops are provided to control the hanging height from the floor, or a ratchet arrangement can be supplied. Models range from $16.50 to $19.50 each.

## Hydraulic Pumping Unit

**The Denison Engineering Co.,** Columbus, O., has announced a new series of oily-hydraulic pumping units for pressures up to 5,000 psi. They are available in 22 models to specifications recommended by the Joint Industry Conference on Hydraulic Standards for Industrial Equipment. Each unit includes a reservoir base, with all operating components including pump, relief valve, gages and electric motor drive, mounted on the top cover. Reservoirs are supplied in 55-, 110- and 165-gallon capacities, of welded steel construction



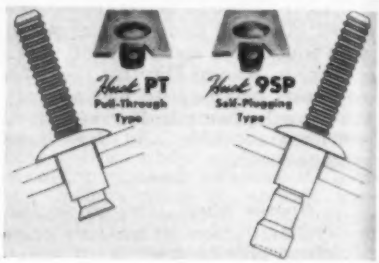
with access door to simplify tank cleaning. Choice of three series Dension Hydraulic pumps of axial piston type available with either constant or variable volume. The 600 series delivers up to 9 gpm at 1,800 rpm in a pressure range to 5,000 psi. The 700 series are rated at 20 gpm at 1,200 rpm for requirements up to 5,000 psi while the 800 series provides up to a maximum of 35 gpm at 1,200 rpm and at the same maximum pressure. For installations where the unit is operated at 50% or more of maximum pressure, or for 10% or more of the total cycle time, an oil cooler is recommended. Bypass circuit and a low-pressure relief valve protect the heat exchanger. A dial temperature gage is provided.

Inquiries about equipment on this page may be sent either to AMERICAN AVIATION or direct to the manufacturer.

Readers looking for sources of special equipment are invited to write to AMERICAN AVIATION's equipment editor. Every effort will be made to provide information on manufacturers and suppliers who are in a position to furnish or develop needed airborne or ground equipment.

## Blind Rivets

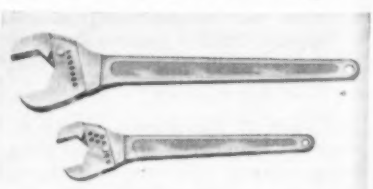
**Huck Manufacturing Co.,** 2480 Bellevue Ave., Detroit 7, Mich., has introduced two new blind rivet types designated the Huck PT pull-through type and the Huck 9SP self-plugging type. Both are available in ⅛", 5/32", 3/16" and ¼" diameters in aluminum alloys or cadmium-plated mild steel with brazier or 100 degree countersunk heads. The PT series have no minimum-grip limitation while the SP series have a grip range of .140" for any grip increment. Positive shank expansion providing ample hole-filling




is claimed as well as engineering features which prevent splitting of the sleeve during formation of the head. Pull grooves provided on the pin tail of the rivet are used to provide positive driving. The pin tail is automatically ejected by the next rivet. The series can be driven by a single operator with a manual or pneumatic pull gun and requires access to only one side of the work. No gun adjustment for grip length is necessary.

## Adjustable Wrenches

**Owantonna Tool Co.,** 403 N. Cedar St., Owatonna, Minn., has introduced two alloy steel, drop-forged adjustable wrenches adjustable to 29 sizes. The smaller wrench, No. OA-24, is 24 inches long, ⅞ inches thick and weighs 10



pounds. It adjusts from 1⅜ inches to 2⅞ inches. The larger wrench, OA-36, is 36 inches long, 1⅛ inches thick and weighs 22 pounds. The latter wrench adjusts from 2⅞ inches to 4¾ inches.

## Metal Marking Stamps

**Acme Marking Equipment Co.,** 3030 Lyndon, Detroit 21, Mich., is marketing a new set of 18 specially-hardened steel stamps, giving 1/16 inch separations and in three sizes: ⅛", 3/16" and ¼" from top to bottom of entire fraction. Sixteen of the 18 stamps are fractional figures including 1/16, ⅛, 3/16, ¼, 5/16, 3/8, 7/16, ½, 9/16, 5/8, 11/16, ¾, 13/16, 7/8, and 15/16 inches. The other two stamps are the whole number "1" and an inches sign. Stamps are provided in hardwood cases, eight stamps to the case.

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AMERICAN AVIATION PUBLICATIONS COVER THE FIELD!

# What Airline Jets Could've Done In 1949

*By* ERIC BRAMLEY

JET TRANSPORTS in 1949 would have had a domestic passenger market of approximately 3 billion revenue passenger-miles, and 90 such planes would have been needed to handle the volume, according to Hal E. Nourse, vice president—economic controls of United Air Lines.

The 3 billion would have been 44.8% of the 6.7 billion revenue passenger-miles flown by trunk and intermediate domestic air carriers, Nourse said, adding that jets will be most effective over non-stop ranges in excess of 350-400 miles. He assumed a 45-passenger transport with a 450-mph cruising speed, 375-mph block speed 1,250-mile non-stop range, average fleet utilization of nine hours daily in summertime.

Nourse

In a paper presented to the SAE aeronautic meeting in New York *(Passenger Markets for Future Airplanes)*, Nourse spoke principally of 1949 and declined to make predictions for any specific future year.

Noting that total intercity travel has been declining since the end of the war, he stated that he did not believe that the curve will get back to the prewar level unless there is a "major economic calamity." He added that air will divert more traffic from Pullman than from any other form of transport, although long-haul rail coach may suffer from air coach service.

## Jet Passenger Ceiling

Discussing jets, Nourse said that in 1949 the domestic airlines and Pullman travel together was only about 29% of combined air, Pullman, rail coach and bus, yet air plus Pullman amounted to between 60% and 70% of the travel over 400 miles. "In the past, the number of passengers carried has varied inversely with the length of haul. This may well put a practical limitation or ceiling on the passenger markets for jet-powered airplanes."

The 1949 passenger-mile total was 6.7 billion, and in September, 1948, about 34.9% of passenger-miles was generated by and between 77 pairs of top-ranking traffic volume cities, each pair of which was 400 or more

## Jet Market Estimate--Future Year

### Based on 1949

*(The 50% and 100% increases shown in columns 2 and 3 "are simply arbitrary and without any particular logic or reason except to establish an arbitrary range upon which to develop some overall perspective as shown in Items 12 through 18 of the tabulation," Nourse states.)*

| | 1949 | 1949 x 1.5 | 1949 x 2.0 |
|---|---|---|---|
| 1. 1949 revenue passenger miles (billions) | 6.7 | ..... | ..... |
| 2. Ratio of jet market to total market (%) | 44.8 | ..... | ..... |
| 3. Jet market estimate (billions RPM's) | 3.0 | 4.5 | 6.0 |
| 4. Average month annual basis (millions RPMs) | 250.0 | 375.0 | 500.0 |
| 5. Average month summer 250 x 1.15 (millions RPMs) | 287.5 | 431.2 | 575.0 |
| 6. Seat miles required for "5" at 70% load factor | 410.5 | 615.8 | 821.0 |
| 7. Jet airplane seat miles produced—one airplane—summer month (millions) | 4.556 | 4.556 | 4.556 |
| 8. Jet airplanes required—summer month | 90.0 | 135.0 | 180.0 |
| 9. DC-6 seat miles produced—one airplane | 3.51 | 3.51 | 3.51 |
| 10. DC-6 airplanes required—summer month | 117.0 | 176.0 | 234.0 |
| 11. No. passengers—jet market (millions) | 2.86 | 4.29 | 5.71 |
| 12. Jet market RPMs—ratio to 1949 air RPMs (%) | 44.8 | 67.2 | 89.5 |
| 13. Jet market RPMs—ratio to 1949 Pullman RPMs (%) | 38.0 | 57.0 | 76.0 |
| 14. Jet market RPMs—ratio to 1949 air plus Pullman RPMs (%) | 20.6 | 30.8 | 41.2 |
| 15. Jet market RPMs—ratio to 1949 air RPMs for trips 400 miles and over | 83.3 | 125.0 | 166.0 |
| 16. Jet market RPMs—ratio to 1949 Pullman RPMs for trips 400 miles and over | 69.7 | 104.5 | 139.5 |
| 17. Jet market RPMs—ratio to 1949 air plus Pullman RPMs for trips 400 miles and over | 38.0 | 57.0 | 76.0 |
| 18. Jet market RPMs—ratio to 1949 air plus Pullman plus rail coach plus bus RPMs for trips 400 miles and over | 23.1 | 34.6 | 46.2 |

NOTE: Nos. 13 through No. 18—RPMs are air distance basis.

## Composition of Market for Future Airplanes

| FROM: | EXTENT OF DIVERSION | REMARKS |
|---|---|---|
| Bus market | Negligible | Look out for favorable price, convenience, and trip length characteristics of bus to protect its market from jet airplanes. |
| Private Auto | Some diversion to air but relatively unimportant to total air | Look out for favorable price characteristics of auto when two or more travel together and for convenience and relatively short average trip length factors. |
| Rail coach | Substantial in long haul market | Price competition will probably be in balance between air and rail coach in years hence, but look out for trip length factor. It will be a protection against air inroads. |
| Pullman | Very substantial penetration | Competition in favor of future airplanes. |
| Self-generation | Unknown but important | Inherent as in past air trends with some acceleration of effect due to added speed. |

miles apart, Nourse said, adding that "if this relationship held generally true for every month of . . . 1949, the market for the year generated by these cities in the above manner would be about 2.34 billion passenger-miles.

"This figure would certainly represent a floor for a jet airplane market as it does not take into consideration passengers traveling over 400 miles that originated at the many smaller, intermediate communities, some portion of which could be counted on to swell the theoretical 1949 jet airplane market.

"It is estimated that in 1949 54% of the domestic intercity air revenue passenger-miles was generated by passengers from all air points, each of whom traveled 400 miles and over by air. Such a percentage applied to the total 1949 air passenger market (6.7 billion x 54%) would indicate a jet airplane market of 3.6 billion . . . It is believed this figure could well represent the ceiling on the 1949 jet airplane market, and it is unlikely that all passengers included in the figure would or could have used the jet airplane schedules had they been in operation in 1949."

### Theoretical Fleet: 90 Jets

"The half-way mark between the two 'bench marks' is about 3 billion . . . so, for purposes of this paper, let this figure be our starting or low point on the passenger market for future airplanes."

The 3 billion figure, he asserted, would have represented 44.8% of the total 1949 air market, and would have required 90 planes. It would have represented 38% of Pullman revenue passenger-miles, 20.6% of air plus Pullman, 83.3% of air passenger-miles for trips of 400 miles or over, 38% of air-Pullman for trips of the same length, and 23.1% for air-Pullman-rail coach-bus trips of that length.

If this jet market were increased 50% over the 1949 estimate, its ratio to 1949 Pullman revenue passenger-miles for trips of 400 miles and over would rise to 104.5%; if it were doubled, the figure would be 139.5% (see table).

The full development of the jet airplane market of the future will probably take place slowly," Nourse said. "A few jet-type airplanes will appear in the domestic operation at first; additional numbers will be added at later dates. It would not surprise me if it took from three to six years after the first jet airplane schedule becomes operative for a full-blown development and a fully extended national pattern with jet transport airplanes to take place."

Air travel has been increasing in the face of declining total intercity travel, but "the continued weakness of the total transportation market

# Over the Counter

### Sales Promotion

CHALK UP a sales promoter for **Andy Burkhardt, America's** sales manager in Charleston, W. Va. The local paper, in its "inquiring reporter" column, had asked the question, "Where would you go if you had an all-expense trip paid anywhere in the world?" Burkhardt went to work on a window display. He had the news item blown up and put on a poster, and answered each vacation dream with schedules, fares and travel tips. It was an eye-catcher, and a fellow who had told the newspaper he wanted to go to Baltimore to see his gal showed up at the AA counter and bought a ticket. Burkhardt's now looking for the man who wanted to go to Mexico.

**United Air Lines** has distributed an attractive and interesting booklet, "The Main Line." It's a history of UAL . . . **Parke Wright, National Airlines'** Washington district sales manager, gets credit for working out a deal with the District of Columbia Credit Union League that should be a revenue-producer. The 80,000 members of the 130 unions in the area can now finance, through their unions, all-expense vacations on a travel-now-pay-later basis (NAL is pushing its $103.35 packaged summer vacation trip to Miami Beach). It's said to be the first time the unions have offered such a vacation service tie-in with a transportation company . . . Doing an effective job of selling National's air coach is a folder, "How big an air travel bargain can you afford?" It points out advantages of using scheduled service instead of non-sked.

**Capital Airlines'** first "Mystery Flight" was a great success (got a nice spread in *Life* Magazine, incidentally). Company sold 40 Philadelphians on chartering a DC-4 ($125 apiece, all expenses) for a vacation weekend. Passengers didn't know their destination until they arrived—it was Grand Bahama Island, off the Florida coast. Capital has more such flights planned . . . Certain to be welcomed by travel agents is **Scandinavian Airlines System's** spring and summer timetable. Says SAS in an accompanying statement: "The entire issue is designed to direct our passenger business to your office. Passengers will contact you, since our U. S. office addresses and telephones are not listed. Instead, your services are featured."

### Traffic, Tariffs and Tours

TWA was scheduled to start its transcontinental one-stop (Chicago) Constellation skycoach service Apr. 30 between New York and Los Angeles at $110 one-way. **American** started its DC-6 transcontinental coach on Apr. 9 . . . **Western Air Lines** on May 1 inaugurates non-stop Convair service San Francisco-Seattle. It's the first experiment with non-stop flights between the points, all schedules heretofore stopping at Portland. WAL tried Los Angeles-Portland non-stop last year with Convairs but found it impractical.

**Pan American World Airways** starts non-stop service Caracas-Miami, Curacao-Port au Prince, and Port au Prince-Miami about May 3 . . . **Piedmont Airlines** opens service to Myrtle Beach, S. C., on May 14 . . . **Southern Airways** will, if CAB approves, offer special "shoppers' excursion fares" between selected points from June 1 through Aug. 31. They will apply to three-day round-trips and are based on 125% of normal one-way fares.

An **Eastern Air Lines'** tariff rule which would have permitted conversion of a one-way ticket into a round-trip, circle trip, or open-jaw ticket after a journey had been commenced, has been ruled unlawful and ordered canceled by CAB. Normally, round-trip tickets, etc., must be bought before commencement of passage to secure applicable discounts . . . **British Overseas Airways Corp.** has announced a 24-hr. trans-Atlantic delivery service of spare parts for British automobiles to anywhere in North America.

**Colonial Airlines** states that a 60-day survey among its Bermuda passengers disclosed that 77.95% of them were against airborne drinking. Colonial is the only Bermuda carrier not serving alcoholic beverages in flight . . . **Delta Air Lines** was to start aircoach service between Chicago, Cincinnati, Atlanta, Jacksonville and Miami on Apr. 30 with 56-passenger DC-4's . . . Delta has completed arrangements for all-expense summer air tours to Miami Beach and the Caribbean Islands, built around 4c per mile aircoach fares . . . **Robinson Airlines** starts service to Middletown, N. Y. on Apr. 30, using Stewart Field, and to Auburn, N. Y. on May 15.

**American Overseas Airlines** will institute first through air service between New York and Cologne/Dusseldorf, Germany, on June 3, subject to government approval. There will be two Constellation flights weekly . . . **United Air Lines** adds a DC-6 flight Washington-Chicago-Denver-San Francisco on Apr. 30 . . . **Western Air Lines** will start service between Lethbridge and Edmonton, Canada, on May 1, using Convairs. The company has arranged to share Edmonton ticket counter space with Northwest, which will initiate Edmonton service on the same day . . . **Trans-Texas Airways** opened service Apr. 22 to McCamey-Sheffield, Tex., on its Dallas-San Angelo-Fort Stockton-El Paso segment.

**Colonial Airlines** asked CAB approval last month of an $85 30-day excursion fare between Washington and Bermuda, effective May 1. CAB had taken no action at presstime. Regular round-trip fare is $126 . . . Air express service between the U. S. and Hawaii will be started May 1 by **Northwest Airlines** and **Railway Express Agency.**

**Eric Bramley**

since the war has had an arresting effect on the air trend," he said. "Will this combination of circumstances continue during the next five to 10 years? Most transportation economists feel that the total transportation market has not quite reached a point of postwar stabilization. In 1949, for instance, it was still about 50 billion revenue passenger-miles compared to about 27 (air distance basis) in 1940.

"In the same breath, let me add that many of us who follow transportation trends do not feel that the overall intercity curve will get back to the prewar level unless a very major economic calamity happens to our country. I make the above observations simply for the sobering effect they may have on those who feel new, fast airplanes may open up vast markets worlds unheard of heretofore."

## NWA Authorized to Suspend At Two Wisconsin Stops

CAB has authorized Northwest Airlines to suspend service at Green Bay and Wausau, Wisconsin, but ordered a hearing on the line's request to discontinue operations at Eau Claire.

Northwest had applied for permission to suspend at all three points during the life of the temporary feeder certificate of Wisconsin Central Airlines which currently serves the cities. The two points at which suspension was authorized are not now being served by NWA because of airport inadequacies, a condition expected to be remedied very shortly.

### CAB CALENDAR

**May 1**—(Docket 4084) Hearing in Enforcement Proceeding against Peninsular Air Transport Associated Airlines Agency, Inc., and National Air Coach Systems, Inc. 10 a. m., Room E-214, Temp. Bldg. 5, Washington. Examiner Edward T. Stodola.

**May 1**—(Docket 52-401(E)-1) Prehearing conference on application of E. W. Wiggins Airways for certificate to operate within 500 mile radius of Boston Municipal Airport. 10 a. m., Room C-116, Temporary Building 5, Washington. Examiner Paul N. Pfeiffer. Postponed from April 17.

**May 4**—(Docket 3748) Oral argument before the Board in American Airlines et al. Service to Springfield, Mass. Case. 10 a. m., Room 5042, Commerce Building, Washington. Postponed from April 17.

**May 8**—(Docket 4211) Hearing on application of American Airlines, Inc., for all-cargo route authority (Los Angeles-San Francisco, et al.). Tentative. Examiner Walter W. Byran.

**May 8**—(Docket 2839) Oral argument before the Board in Western Air Lines-United Air Lines Route 68 Transfer Case (Labor Phase). Room 5042, Commerce Building, Washington.

**May 15**—(Docket 4302) Hearing on National Airlines-Eastern Air Lines tariffs proposing daylight departures for coach flights. Tentative. Examiner Paul N. Pfeiffer.

**May 22**—(Docket 2123 et al.) Oral argument before the Board in Additional Service to Puerto Rico Case. 10 a. m., Room 5042, Commerce Building, Washington.

**June 12**—(Dockets 4228 and 4229) Hearing in Philadelphia Service Suspension Case—Foreign Routes of American Overseas Airlines and Transcontinental & Western Air, Inc. Tentative.

**June 12**—(Docket 2019 et al.) Hearing in Reopened Additional California-Nevada Service Case. Tentative. Examiner F. Merritt Ruhlen.

**June 19**—(Docket 4290) Hearing in investigation of tariff practices of Northwest Airlines and non-certificated operations of Fly Freight, Inc., and Sterling Freightways. Tentative. Examiner Walter W. Bryan.

## Aiding Apes Aloft

What to do with anthropoid apes if they start to pine during a long air journey, and how to catch foxes if they get loose during the flight are but two of the subjects covered in a manual issued by British Overseas Airways Corp.

The airline, which is doing an increasing business in the carriage of animals, has distributed the 40-page manual ("Carriage of Livestock") to personnel throughout the system. It's probably the most complete manual on the care and handling of animals during flight, and contains customs and health regulations, a complete list of animals and their peculiarities, detailed timetables on feeding and the various foods to be used, temperatures and air pressures during flight, etc.

So impressed was the London *Times* that it devoted almost a full column to the publication in both its domestic and overseas editions, plus an editorial entitled "Beasts in the Sky." Concluded the *Times:* "Even if you have to feed them on raw meat, or swaddle them in kapok or pick them up by their tails in an emergency, animals sound as if they give far less trouble than human beings to those who have to fly them about the world."

To get back to anthropoid apes, the manual notes that they often pine and die if left alone. They must therefore have "companionship of human beings or others of their own species" and should not be accepted for shipment unless accompanied by an attendant. During cold weather, they must be given a gunny bag or blanket "to enable them to wrap themselves up during the journey."

If a fox gets loose in the airplane, he should be "gripped by the tail and held at arm's length from the body." A kangaroo will try to kick you in the stomach—he should be "grasped by the tail, then forced down and gripped by the neck." Snakes must always be gripped by the neck. "Poisonous snakes are easily mastered by those acquainted with them; others should not attempt to do so. They mostly like to crawl into a dark corner . . . If they cannot be caught they should be beaten to death."

With sea lions and seals, the best method is to "take hold of the rear fins, and take care that the head cannot reach legs or feet."

The manual gives tips on what to carry and how to carry it. Bulldogs are not good air travelers and have difficulty in breathing at high altitudes. Lions, tigers, etc., over six months old have "dangerous characteristics" and should not be accepted. Birds do not eat in the dark "and attention must be paid to this point to see that they are not stowed in a dark hold, and that the cages are placed facing the light. Reptiles can be carried in the dark. Mammals are best carried in semi-darkness, as they will be more restful."

Mammals should be packed in nose and paw-proof containers. Oblong boxes are best—an animal has the chance of bracing itself against the sides on the shorter axis "which it will quickly learn to do." Partridges and pheasants may jump and injure their heads, so a piece of canvas should be stretched about two inches below the solid roof, forming a false roof.

There are also certain watering and feeding rules, the manual notes. Spirited animals such as racehorses "must be accompanied by an attendant who is familiar with the handling of the animal and with the injection of calming hypodermics. The attendant must also see to it that the animal shows moderation when drinking water at a transit stop. It is possible that its increased weight might upset loading trim of aircraft."

Several types of monkeys, it says, "can easily be trained to drink from the spout of a water can or bottle . . . Monkeys quickly learn to drink in turn and this gives the attendant good opportunities of getting to know them individually and studying their particular needs." Crocodiles must be watered daily "with a hose" but do not require any food on trips of up to six days.

The manual, by its very nature, has caused numerous laughs throughout the BOAC system and elsewhere. However, it's a serious work and is proving valuable to the airline's personnel.

# Airline Commentary

By Eric Bramley

WITH flying saucers reported around Albuquerque, N. M., the following amusing and well-written story is very appropriate. Our thanks to Marjorie Pickett and Ernest Paul, of Monarch Air Lines, Albuquerque, for sending it. The title: "Murky in Albuquerque." Read on:

The day of Mar. 27, 1950, in Albuquerque was dominated by howling winds, ceiling zero, account sand. By afternoon the lobby of the Municipal Airport terminal was crowded with weary passengers, deplaned here account weather north, east, south and west, which stranded TWA Connies as well as CAL Convairs and PAL and MAL DC-3's.

Weary waitresses in the coffee shop and airport bar stumbled to and fro peddling liquids to parched throats. Occasionally, above the disconsolate drone of hundreds of voices, the loudspeaker from one of the airline ticket counters blared a call for a passenger to check the counter, momentarily halting the buzz as the crowd listened as one for estimated departure times. The airport was a humid, hot, smoke-filled inverted bowl teeming with disgusted humanity, set apart from the rest of the world by howling, flying sand.

At 1447 a sleepy voice intoning an announcement began over the PA system. The hum of conversation lessened. Gradually a perceptible tension grew as the voice progressed:

"May I have your attention please! Trans-Atmospheric Lines announces the arrival of Flying Saucer 601 from the Planet Mars at Gate 3. Passengers and spectators please remain clear of the ramp until all occupants of Saucer have desaucered. This precaution necessary account diminutive size of these passengers, which averages 27 inches. Passengers and spectators now in terminal building will please group in the righthand portion of the lobby, clearing coffee shop and bar.

"Instructions to kitchen: please prepare to change menus immediately. All cooks retire to mesa just beyond parking area to round up all available thorns, nuts, nails and bolts. Prepare in a light soup. Thank you. Instructions to bartenders: empty all alcoholic contents from bottles. Prepare to serve bottles.

"Instructions to occupants of Flying Saucer 601: when desaucering, will all passengers with two heads please line up and count noses and divide by two. One-lens sunglasses available at the tourists' Indian jewelry counter for all those who are blinded by earthglare and possess but one eye. Please make every attempt to conceal horns and other appendages foreign to earth-eyes to avoid possibility of being trampled in a general stampede to clear building. Thank you."

No one heard the "thank you." The building was quiet . . . in fact, vacant.

•

*We were told the other day that one airline's bill for chewing gum for passengers last year was $12,000. Wasn't a particularly big airline, either. Seems like we remember the time when gum companies furnished their product gratis for the advertising value. The lifesavers being used by some of the airlines are furnished free, we understand. Will it last, or will the lifesaver bill be 12 grand after awhile?*

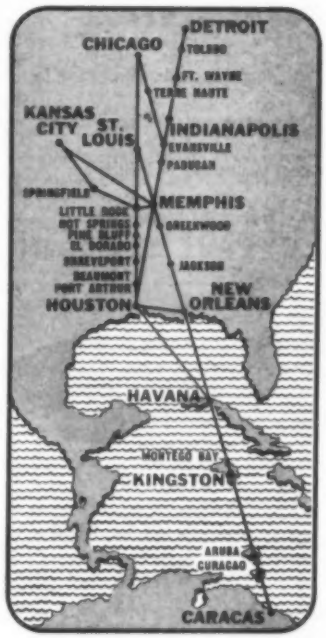
•

Notes about people: Reports are that **Patty Patterson,** beauteous daughter of **W. A. Patterson,** president of United, quietly went out and took flying lessons and soloed before father found out about it. She did it at **John Wilson's** Midwest Aviation, Sky Harbor Airport . . .

Ohio switched license plates from numbers to letters this year, and **Paul Strahm,** veteran TWA district manager at Columbus (he's been there 13 years), was on the ball. His car now carries the license "TWA." Beat out a lot of people for it, too . . .

**M. E. "Chatty" Sullivan,** Western Air Lines' director of traffic, is running for councilman out in El Segundo, Calif. Saw some things in the city government he didn't like and decided to do something about it. His handbill says he's "the people's representative" and that "he wears no man's collar and serves the will of the people." Good luck, Chatty . . .


FLY C&S DIRECT



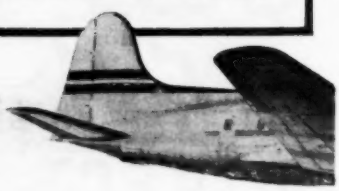

The ideal Trans-Caribbean air route for businessmen, cargo shippers, and vacationists. Fast 4-motored Dixieliners provide the only one-carrier service between the Great Lakes region and the important Caribbean ports of Havana, Jamaica, and Caracas. Flights each day through the Houston and New Orleans gateways. Contact your travel agent or C & S ticket office for reservations and information.

CHICAGO & SOUTHERN AIR LINES

C★S

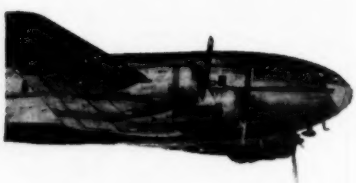
General Office — Memphis, Tenn.

# Confidence



***THIS IS CONFIDENCE...***

the appointment of AE&P by Trans World Airlines as exclusive agent for the sale of their five Boeing 307 Stratoliners.



***THIS, TOO, IS CONFIDENCE...***

the world's leading airlines use the facilities of AE&P—justified by the speed and accuracy with which we supply engine parts, overhaul tools and all kinds of aeronautical equipment.

***For your procurement, call on AE&P ...with confidence.***

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# Airline People

## ADMINISTRATIVE

**Russell LeBrock,** mail and express superintendent of United Air Lines, and **John A. Smith,** cargo sales manager of Continental Air Lines, were appointed chairman, respectively, of the operating practices committee and the policy committee of the air express division of the Air Transport Association.

**John V. Weesner** has been elected vice president and a director of Turner Airlines, and **K. Robert Hahn** has been named secretary. **Reginald E. Ross** also was added to the board of directors, he and Weesner succeeding **John P. Moore** and **Samuel J. Solomon,** both of whom resigned.

**Lars-Georg Romberg** has been appointed technical assistant to **Tore H. Nilert,** president of Scandinavian Airlines System, Inc. Formerly supervisor of operational training, Romberg joined SAS in 1947 after serving as engineer-office and test pilot with the Swedish Air Force.

**William T. Raymond,** formerly direc- for of government affairs for the Air Transport Association, has joined Eastern Air Lines as assistant to **M. M. (Jack) Frost,** vice president. Raymond, a lawyer and a former newspaperman, had been with ATA for six years.

## OPERATIONS-MAINTENANCE

**C. W. Moore** has been elected vice president-operations of Helicopter Air Service, Inc.

Dymond

**Capt. Lewis W. Dymond,** assistant operations manager for National Airlines for the past four years, has been promoted to the newly created position operations manager. He joined NAL in 1938 as aircraft cleaner and apprentice mechanic and rose to become a flight captain and then assistant operations manager.

**A. H. Kipfer,** manager of operations for American Airlines at Albany for the past two years, has been transferred to New Haven in the same capacity. **L. G. Bryant,** manager of operations at Westfield, Mass., for the past five years, has taken over the Albany post, and Chief Agent **P. J. Feeney** at Westfield has been promoted to acting manager of operations.

**Eugene T. Thummel,** who joined Pioneer Air Lines in 1947 as a transportation agent, has been named superintendent of passenger service. His most recent post had been as district traffic and sales manager for the Amarillo-Plainview-Lubbock-Roswell-El Paso area.

## TRAFFIC & SALES

King

**Rodney W. King,** formerly director of reservations and ticket offices for American Airlines, has been appointed general traffic manager of Eastern Air Lines, succeeding **Robert Turner,** resigned. **Frank Sharpe,** King's assistant at American, also has joined the Eastern organization.

**Dhan Mukerji** and **Charles J. Cole** have been named sales manager and traffic manager, respectively, for the Atlantic Division of Pan American World Airways. Mukerji, who joined Pan Am in 1941, was formerly assistant traffic manager for the company's Pacific-Alaska Division. Cole has recently been assistant to **R. C. Lounsbury,** general traffic manager, and before that assistant to **David S. Ingalls,** vice president. He joined PAA in 1938.

Mukerji

Cole

**Stanley C. Kennedy, Jr.,** cargo manager of Hawaiian Airlines for the past 18 months, has been promoted to sales manager.

**Freeman E. Fish** has been promoted to district traffic and sales manager with Continental Air Lines at Denver, succeeding **Brooke B. Burnham,** who resigned to go into the ranching business.

**Alan G. Pedersen** has been named district cargo manager for United Air Lines in San Francisco. He joined UAL in 1946 as a counter agent and became a cargo salesman the following year.

**Melville S. Smith, Jr.,** has been appointed to the new post of district sales manager for National Airlines in the Orlando-Lakeland-Daytona Beach area. He has been reservations superintendent at Jacksonville.

**Reginald V. Lytle,** regional agency representative in Chicago for Eastern Air Lines for the past three years, has been promoted to assistant manager of the agency division in EAL's New York home office.

**Spencer Rice,** flight dispatch assistant for American Airlines in New York since 1949, has returned to Chicago as a sales representative.

# U. S. Domestic Airline Revenues & Expenses, October-December

| AIRLINES | TOTAL OPERATING REVENUES | PASSENGER REVENUES | MAIL REVENUES | EXPRESS REVENUES | FREIGHT REVENUES | EXCESS BAGGAGE REVENUES | NON-SCHEDULED TRANSPORT REV. | TOTAL OPERATING EXPENSES | AIRCRAFT OPERATING EXPENSES | GROUND & INDIRECT EXPENSES | NET OPERATING INCOME |
|---|---|---|---|---|---|---|---|---|---|---|---|
| American | $ 24,801,498 | $ 20,560,169 | $ 1,484,616 | $ 584,046 | $ 1,817,219 | $ 230,104 | $ 37,955 | $ 23,560,636 | $ 11,723,183 | $ 11,837,453 | $ 1,240,861 |
| Braniff | 3,655,991 | 2,795,637 | 590,338 | 81,533 | 92,885 | 22,281 | 58,957 | 3,527,263 | 1,705,915 | 1,821,348 | 128,728 |
| Capital | 6,961,300 | 4,612,867 | 1,163,322 | 196,493 | 460,112 | 24,406 | 234,374 | 6,703,593 | 3,193,362 | 3,510,231 | 257,707 |
| Caribbean | 196,595 | 102,624 | 76,661 | . . . . | 6,724 | 722 | 1,564 | 208,758 | 99,040 | 109,718 | -12,163 |
| C & S | 2,130,613 | 1,533,306 | 462,909 | 40,849 | 47,944 | 18,005 | 18,946 | 2,011,282 | 902,320 | 1,108,963 | 119,331 |
| Colonial | 1,011,151 | 670,866 | 311,168 | 8,920 | 10,542 | 4,217 | 810 | 1,070,992 | 491,652 | 579,340 | -59,841 |
| Continental | 1,271,440 | 840,638 | 333,868 | 8,877 | 76,260 | 6,796 | 39,661 | 1,414,321 | 656,934 | 757,387 | -142,881 |
| Delta | 3,896,260 | 2,933,526 | 707,889 | 62,957 | 123,495 | 35,464 | 14,993 | 3,785,242 | 1,766,601 | 2,018,641 | 111,018 |
| Eastern | 16,039,172 | 13,810,317 | 899,741 | 369,121 | 696,697 | 192,601 | 84,194 | 16,218,081 | 8,821,836 | 7,396,245 | -178,909 |
| Hawaiian | 756,611 | 599,081 | 11,617 | 33,932 | 74,182 | 18,415 | 7,207 | 858,758 | 332,905 | 525,852 | -102,127 |
| Inland* | 636,702 | 439,393 | 178,128 | 6,535 | 6,457 | 4,210 | 928 | 541,823 | 233,074 | 308,749 | 94,879 |
| MCA | 1,874,164 | 1,366,858 | 414,818 | 19,454 | 27,480 | 11,609 | 23,202 | 1,782,492 | 784,666 | 997,826 | 91,672 |
| National | 3,064,892 | 2,399,177 | 433,566 | 84,528 | 58,621 | 54,039 | 10,171 | 3,368,636 | 1,739,955 | 1,628,681 | -303,744 |
| Northeast | 1,315,635 | 807,519 | 390,820 | 17,774 | 22,171 | 1,386 | 5,520 | 1,423,430 | 720,136 | 703,294 | -107,795 |
| Northwest | 7,001,483 | 5,748,137 | 740,466 | 166,149 | 294,212 | 38,632 | 24,236 | 8,905,863 | 4,576,295 | 4,329,568 | -1,904,381 |
| Trans Pacific | 171,345 | 101,322 | . . . . | 459 | 7,643 | 2,424 | 56,402 | 218,898 | 75,340 | 143,558 | -47,553 |
| TWA | 15,378,537 | 12,375,113 | 1,457,346 | 490,795 | 665,749 | 133,087 | 161,039 | 14,756,894 | 7,035,661 | 7,721,233 | 621,643 |
| United | 20,537,126 | 16,420,914 | 1,723,655 | 653,229 | 1,202,747 | 136,248 | 161,510 | 20,540,610 | 9,533,740 | 11,006,869 | -3,484 |
| Western* | 2,367,608 | 1,434,851 | 461,285 | 33,819 | 24,129 | 10,440 | 377,345 | 2,232,416 | 1,076,695 | 1,155,721 | 135,192 |
| TOTALS | 113,068,143 | 89,552,515 | 12,094,213 | 2,861,630 | 5,595,379 | 945,086 | 1,319,024 | 113,129,988 | 55,471,210 | 57,658,777 | -61,847 |

* Operations of Western and its subsidiary, Inland, should be considered as consolidated, although reports are filed separately as shown here.

NOTE: Under CAB filing procedures, the airlines file a cumulative quarterly financial report for October-December in place of a separate report for the month of December. Traffic data, however, are reported separately for each month.

# U. S. Domestic Airline Revenues & Expenses for 1949

| AIRLINES | TOTAL OPERATING REVENUES | PASSENGER REVENUES | MAIL REVENUES | EXPRESS REVENUES | FREIGHT REVENUES | EXCESS BAGGAGE REVENUES | NON-SCHEDULED TRANSPORT REV. | TOTAL OPERATING EXPENSES | AIRCRAFT OPERATING EXPENSES | GROUND & INDIRECT EXPENSES | NET OPERATING INCOME |
|---|---|---|---|---|---|---|---|---|---|---|---|
| American | $ 99,404,070 | $ 84,915,565 | $ 5,379,390 | $ 1,816,439 | $ 5,962,307 | $ 990,387 | $ 148,348 | $ 89,961,916 | $ 43,221,306 | $ 46,740,610 | $ 9,442,154 |
| Braniff | 14,527,520 | 11,393,620 | 2,321,341 | 266,181 | 275,272 | 104,879 | 146,297 | 14,050,713 | 6,867,230 | 7,183,482 | 476,807 |
| Capital | 26,905,836 | 19,237,207 | 4,567,313 | 567,937 | 1,521,340 | 111,051 | 554,533 | 25,586,399 | 12,042,673 | 13,543,725 | 1,319,437 |
| Caribbean | 792,269 | 522,995 | 209,726 | . . . . | 32,898 | 3,185 | 4,745 | 801,241 | 355,840 | 445,402 | -8,972 |
| C & S | 8,583,730 | 6,330,851 | 1,800,384 | 169,304 | 150,418 | 76,598 | 25,065 | 7,783,557 | 3,342,318 | 4,441,239 | 800,173 |
| Colonial | 4,445,132 | 3,103,724 | 1,225,679 | 27,132 | 45,743 | 24,733 | 8,824 | 4,228,691 | 1,978,387 | 2,250,305 | 216,441 |
| Continental | 5,247,499 | 3,557,067 | 1,379,129 | 35,983 | 90,164 | 29,213 | 83,417 | 5,560,788 | 2,567,943 | 2,992,846 | -313,289 |
| Delta | 15,897,974 | 12,635,875 | 2,384,488 | 209,499 | 401,566 | 160,192 | 24,431 | 15,191,108 | 7,089,197 | 8,101,912 | 706,866 |
| Eastern | 68,853,652 | 61,293,018 | 3,246,459 | 1,202,521 | 1,804,428 | 949,885 | 199,336 | 64,908,783 | 34,148,629 | 30,760,154 | 3,944,869 |
| Hawaiian | 3,518,404 | 2,931,966 | 37,259 | 130,246 | 291,016 | 84,921 | 21,926 | 3,392,732 | 1,347,029 | 2,045,703 | 125,672 |
| Inland* | 2,682,934 | 1,967,002 | 640,905 | 21,705 | 30,721 | 17,141 | 1,929 | 2,178,305 | 926,789 | 1,251,516 | 504,630 |
| MCA | 7,515,155 | 5,764,127 | 1,467,276 | 73,919 | 89,592 | 48,615 | 48,868 | 6,975,367 | 3,035,437 | 3,929,929 | 539,789 |
| National | 12,983,817 | 10,228,284 | 2,024,186 | 187,524 | 240,678 | 223,222 | 16,596 | 12,931,162 | 6,680,500 | 6,250,662 | 52,655 |
| Northeast | 5,793,502 | 3,992,450 | 1,565,437 | 45,886 | 82,606 | 17,694 | 10,227 | 5,728,267 | 2,855,047 | 2,873,220 | 65,234 |
| Northwest | 27,360,509 | 22,497,714 | 2,962,918 | 554,816 | 1,003,550 | 174,942 | 72,960 | 28,541,587 | 13,429,871 | 15,111,716 | -1,181,078 |
| Trans Pacific | 529,759 | 344,919 | . . . . | 489 | 14,782 | 9,065 | 151,752 | 834,559 | 287,924 | 546,634 | -304,799 |
| TWA | 63,710,914 | 52,750,808 | 5,719,927 | 1,586,127 | 2,265,824 | 619,160 | 404,458 | 61,115,273 | 29,622,712 | 31,492,561 | 2,595,641 |
| United | 87,010,702 | 72,388,958 | 6,482,909 | 2,073,266 | 4,258,363 | 732,219 | 473,327 | 82,035,526 | 37,803,028 | 44,232,498 | 4,975,176 |
| Western* | 8,859,596 | 6,057,174 | 1,863,267 | 99,004 | 100,753 | 43,523 | 602,097 | 8,379,765 | 4,068,454 | 4,311,310 | 479,832 |
| TOTALS | 464,622,974 | 381,913,324 | 45,277,993 | 9,087,978 | 18,662,021 | 4,420,625 | 2,999,136 | 440,185,739 | 211,670,314 | 228,505,424 | 24,437,238 |

* Operations of Western and its subsidiary, Inland, should be considered as consolidated, although reports are filed separately as shown here.

# U. S. Domestic Airline Revenues & Expenses for January

| AIRLINES | TOTAL OPERATING REVENUES | PASSENGER REVENUES | MAIL REVENUES | EXPRESS REVENUES | FREIGHT REVENUES | EXCESS BAGGAGE REVENUES | NON-SCHEDULED TRANSPORT REV. | TOTAL OPERATING EXPENSES | AIRCRAFT OPERATING EXPENSES | GROUND & INDIRECT EXPENSES | NET OPERATING INCOME |
|---|---|---|---|---|---|---|---|---|---|---|---|
| American | $ 7,124,059 | $ 5,863,290 | $ 465,110 | $ 169,452 | $ 518,838 | $ 81,495 | $ . . . . | $ 7,526,550 | $3,647,448 | $3,879,102 | $ -402,491 |
| Braniff | 1,055,947 | 777,633 | 192,881 | 21,073 | 26,295 | 8,397 | 33,384 | 1,181,139 | 580,057 | 601,082 | -125,192 |
| Capital | 1,899,463 | 1,159,443 | 520,474 | 55,845 | 106,944 | 8,358 | 25,831 | 2,013,548 | 892,515 | 1,121,033 | -114,084 |
| Caribbean | 62,754 | 40,317 | 17,103 | . . . . | 2,966 | 298 | . . . . | 66,890 | 29,019 | 37,871 | -4,137 |
| C & S | 573,679 | 392,386 | 146,635 | 13,334 | 13,593 | 5,095 | . . . . | 640,963 | 263,599 | 377,364 | -67,283 |
| Colonial | 243,637 | 154,701 | 81,190 | 1,988 | 3,046 | 1,467 | 556 | 322,150 | 139,007 | 183,143 | -78,513 |
| Continental | 372,330 | 242,300 | 111,671 | 2,544 | 6,013 | 2,150 | 3,654 | 460,306 | 209,311 | 250,995 | -87,976 |
| Delta | 1,473,677 | 1,158,581 | 228,034 | 19,584 | 32,874 | 17,735 | 6,798 | 1,406,923 | 670,688 | 736,235 | 66,753 |
| Eastern | 6,141,001 | 5,475,784 | 257,758 | 110,224 | 180,812 | 98,424 | 6,664 | 5,670,982 | 3,043,193 | 2,627,789 | 470,019 |
| Hawaiian | 247,496 | 212,060 | 2,335 | 8,967 | 17,010 | 6,138 | 395 | 279,631 | 112,191 | 167,440 | -32,135 |
| Inland* | 212,852 | 148,478 | 60,075 | 1,000 | 1,606 | 1,402 | . . . . | 186,317 | 77,266 | 109,051 | 26,535 |
| MCA | 562,327 | 388,273 | 158,100 | 4,925 | 6,233 | 3,512 | 133 | 555,789 | 222,982 | 332,807 | 6,538 |
| National | 1,402,697 | 1,151,004 | 163,604 | 36,922 | 22,045 | 19,457 | 3,548 | 1,224,490 | 643,487 | 581,003 | 178,207 |
| Northeast | 331,414 | 189,434 | 107,390 | 4,900 | 4,876 | 701 | . . . . | 453,194 | 222,463 | 230,731 | -121,781 |
| Northwest | 1,804,246 | 1,436,642 | 230,747 | 42,195 | 70,035 | 12,236 | 8,687 | 3,076,517 | 1,601,141 | 1,475,376 | -1,272,271 |
| Trans Pacific | 65,724 | 49,290 | . . . . | 91 | 900 | 639 | 13,954 | 68,848 | 27,810 | 41,038 | -3,124 |
| TWA | 4,066,068 | 3,279,993 | 416,378 | 102,808 | 186,019 | 43,087 | 19,411 | 4,663,615 | 2,261,324 | 2,402,291 | -597,548 |
| United | 5,515,854 | 4,356,012 | 544,902 | 218,810 | 314,634 | 41,453 | 7,485 | 6,564,058 | 2,996,038 | 3,568,020 | -1,048,203 |
| Western* | 704,710 | 422,624 | 143,343 | 8,500 | 8,855 | 3,794 | 114,227 | 768,998 | 378,336 | 390,662 | -64,289 |
| TOTALS | 33,859,935 | 26,898,245 | 3,847,730 | 822,762 | 1,522,394 | 355,838 | 244,727 | 37,130,908 | 18,017,875 | 19,113,033 | -3,270,975 |

* Operations of Western and its subsidiary, Inland, should be considered as consolidated, although reports are filed separately as shown here.

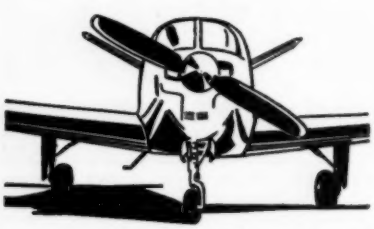
NOTE: These figures are taken from monthly reports filed by the airlines with CAB. The data are tentative and subject to later change.

# Businesses that grow need the go of a Beechcraft

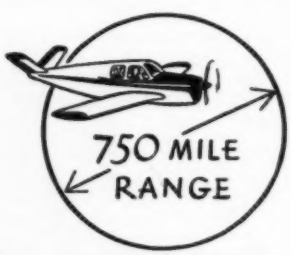
**You make more calls** when you cruise at a 170-mile clip. No wasted time, no wasted effort. Travel *means* more! Minutes in the air pay you back with hours of productive time.

**You get to *where* the business is** in luxurious comfort. Room to spare for four big people in the smartly tailored, quiet Beechcraft Bonanza cabin. Maximum 5-way visibility.

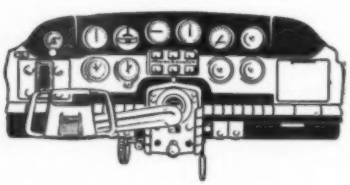
**You travel in safety.** The B-35 Beechcraft Bonanza is extra rugged, withstanding shock and stress tests far surpassing CAA requirements. All-metal construction.



**You get top performance.** Flight characteristics make it exceptionally easy to handle. Speed, range and fuel economy unexcelled! Wide, sturdy landing gear smooths out short, rough-field landings.




**You get amazing efficiency.** At cruising, the Beechcraft Bonanza uses only 56% of the engine's rated take-off horsepower! And fuel consumption is low—amounting to only 9.5 gallons per hour!



**You enjoy many extra features.** For instance, a functionally designed instrument panel, highly efficient . . . but handsome, too! Touches of luxurious comfort everywhere—even to coat hangers, ash trays, map pockets!

**Get all the facts!** There are hundreds more . . . about the extra advantages of the new Model B-35 Beechcraft Bonanza. Check with your nearest Beechcraft distributor or dealer, or write for complete information on your company letterhead to Beech Aircraft Corporation, Wichita, Kansas, U.S.A.

*Top speed, 184 mph*
*Cruising speed, 170 mph*
*Range, 750 miles*
*Fuel economy, 9.5 gph*

Beechcraft BONANZA

***BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS***

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AAAE Convention

# Petroleum Industry Working On Airport Fueling Problems

By KEITH SAUNDERS

ON THE THEORY that airport managers have enough other problems without having to spend much of their time studying fueling problems, the American Petroleum Institute's Aviation Technical Service Committee is bringing the industry's accumulated know-how to bear on such problems and is hopeful of coming up in the not-distant future with some worthwhile recommendations.

Aubrey Keif, chairman of the committee, gave delegates to the recent convention of the American Association of Airport Executives an insight into how the committee is function- and what it hopes to accomplish.

The committee was set up last November and has as its disposal the engineering talent of the 18 member companies of the API. It also has a full-time secretary and staff representative in the person of E. E. Lothrop.

It has as its aim the study of engineering and safety problems pertaining to the delivery, storage and distribution of aviation fuels and lubricants at airports; to the fueling of airplanes, and to the construction, operation and maintenance of facilities used in such deliveries storage and fueling; and to dissemination of data and advice on such problems to airport operators and other interested parties.

## Three Fueling Systems

Keif said the three generally accepted ways of refueling airplanes at airports—from service pits, from trucks and from hydrants through hose carts of the jeep type—all have the advantage of mobility but the disadvantage of high initial and uneconomical operating costs.

He said the committee will make a careful study of the presently available equipment, to the one-point refueling system, to underground fueling development, to special fueling pump development, and to portable and pit installation developments, and after inspections and demonstration of such systems and equipment, would make further careful engineering investigations before making any definite recommendations.

The committee's investigation of each system will begin with its field storage facilities for aviation fuels, the technical service committee chairman told the AAAE.

"Thought will be given to the size of storage tanks that should be used, to the total capacity; how they shall be loaded—from rail, barge, truck transport or pipeline; and whether different brands should be segregated or comingled," he said.

## Gas Transfer Problems

Also, he pointed out, in considering how aviation gasolines shall be moved from field storage to the servicing unit, the committee will find itself confronted with variables such as: should the truck loading ramps be near the field storage or remote therefrom in order to minimize service truck driving time and so keep at a low figure the number of trucks required for service.

Careful consideration will be given, he promised, to whether or not service pit or hydrant pipelines should be connected direct to field bulk storage, or should the expense of pipeline installation be reduced by having satellite tankage near the point of service outlet served by truck transport delivery from bulk field storage.

With the demand for aviation petroleum products steadily rising, the committee will give serious consideration, Keif said, to moving fuel at airports by pipeline systems as opposed to the use of airport trucks, except at smaller airports.

The requirements at smaller airports will not be overlooked, however, and information concerning adequate servicing equipment and storage facilities at such fields is being assembled by the committee for subsequent dissemination.

Careful study will be made of airport fuel pit systems and careful coordination undertaken with fuel system manufacturers for the improvement of such pits, with safety as the first consideration of the committee in each instance. At larger airports, the committee will evaluate the hydrant-hose cart system, which has many advantages in the servicing of larger type transport aircraft.

Turning to specific committee proj-

**WNA Construction**—Extension of the administration building at Washington National Airport, 50% completed, will be ready for occupancy in December, well ahead of schedule. This extension of the south concourse will add 61,000 square feet, to be used as operational and office space for airlines and allied firms. The air mail post office will be enlarged and another exit will be provided for passengers. This new wing will also have stores and a bank.

# Airport News Digest

• **Despite the Ohio Supreme Court's** invalidation on a technicality of the majority vote given the Cleveland airport bond issue last fall, the $5,500,000 issue will be re-submitted to the voters at the November general election. Airline representatives are urging the city to undertake immediate measures to bring at least temporary relief for the situation created by trying to fit 1950 airline traffic into the 1929 passenger terminal at Cleveland Municipal Airport.

• **An airport rating system devised by the** Vermont Aeronautics Commission has been adopted for the six-state New England area by the aviation committee of the New England Council. The plan provides for an annual inspection of airports in the area by state aviation officials and members of a citizen's committee, with ratings to be based on the appearance of physical facilities and the adequacy of service provided by airport operators.

• **The state-operated T. F. Green (Hillsgrove)** Airport at Providence will be able to have an instrument landing system, as a result of the program to build a new 5,500-foot runway paralleling the existing northeast-southwest runway, the end of which is so close to buildings that the ILS could not properly function there. The new runway is part of a $1,500,000 expansion program on which work is to start shortly.

• **Plans for a new $100,000 terminal** at Columbia (S. C.) Municipal Airport have been approved by the CAA, which has agreed to match local funds for financing the building. Terminal facilities at the field have been housed in a hangar since the state-built terminal burned to the ground three years ago.

• **Low bids opened recently on contracts** for the new terminal building at Philadelphia International Airport totaled $7,132,091, or more than $3,000,000 in excess of the city's available airport funds. The city will now attempt to carve out those phases of the project which can be undertaken with the available funds and then perform the other work when new money is obtained.

• **Michigan's Governor G. Mennen Williams has** stated he will ask the Legislature next year to appropriate more than $1,000,000 to pay the state's share of the cost of a $7,000,000 airport construction program benefitting 34 communities.

• **The Port of Seattle Authority has given** assurances that the county will be reimbursed for its share of the cost of a new $100,000 freight terminal at the county-owned Boeing Field, if and when the Port takes over the airport. Thus assured, the county will go ahead with plans for the proposed building.

• **The Omaha Airport Commission had to decline** with thanks a tentative allocation of $225,000 of Federal-aid funds for the further improvement of Omaha Municipal Airport, due to the city's inability to provide matching funds at this time.

• **A Civil Aeronautics Administration recommendation** that the Instrument Landing System at the new Greater Pittsburgh Airport be relocated to the east-west runway and that 1,000 feet be added to that strip will cost the county about $1,000,000 and will delay the scheduled December 1 opening of the airport until next spring.

• **San Antonio City Council has approved** a contract with Atlee B. and Robert Ayres, architects, for plans and specifications of a $700,000 administration building at Municipal Airport.

• **The City of Charleston (S. C.) decided** not to lease the Sky Lounge and Restaurant in its new airport terminal to a concessionaire and will operate it under city management, with William E. Wingate as manager.

• **Municipal airport that has served** Marion, Ohio, for more than 20 years has been closed because liability insurance carried on it had expired. What will be done with the hangars and land has not been decided. City's new municipal airport will be completed in about 60 days.

• **Mayor James W. Elmore** of Knoxville has announced his intention of proposing a revenue bond issue of approximately $400,000 to match Federal funds for an expansion of McGee-Tyson Airport. The airport has no bonded indebtedness at present.

• **The President has signed** the bill increasing by $4,000,000 the $13,000,000 authorization for construction of public airports at Fairbanks and Anchorage, Alaska. The bill gives CAA control over their operation and maintenance.

ects already under way, Keif reported that staff work is well advanced on the two subjects the committee has given top priority after consultation with the Civil Aeronautics Administration. The first of these is the drafting of safety rules and regulations for tank trucks used in aircraft fueling operations. The petroleum companies, he said, have had practical experience in such matters before, having been called in by the Port of New York Authority to assist that agency in formulating the rules now governing operation of fuel trucks on airports under its jurisdiction.

The second project on which work is in progress contemplates the standardization of specifications for tank-truck refueling equipment.

Keif said, in conclusion, that the Aviation Technical Service Committee has no intention of suggesting how any airport manager shall conduct his business, but is merely desirous of pooling its member's experience and know-how in a program from which there will evolve "intelligent and acceptable suggestions for the safe, economical and rapid handling of aviation petroleum products at airports."

# Jet Runway Damage Minimized in Tests

Those jets that will be using your airport a few years hence are not going to do nearly as much damage to your runways, taxiways and aprons as you may have been led to believe.

This reassuring statement comes from Henry Aaron, chief of the paving and soils branch of CAA's Office of Airports, who reported on current thinking on this subject to the annual meeting of the Airport Division of the American Road Builders' Association recently.

The doom that was to befall existing pavements with the advent of jet aircraft has not yet come to pass on fields where such planes are based, he said, and a more sober appraisal on the part of airport officials has resulted in the dissipation of much of the anxiety that was previously felt.

## Study Spillage Effects

Aaron said there are definite indications that the operation, servicing and maintenance of jet aircraft do cause damage to bituminous pavements and to the sealing compound in the joints of concrete pavement, but this damage has not been found to be as disastrous as first believed on dense graded, tightly sealed bituminous concrete surfaces or on well-constructed portland cement concrete pavements.

Special investigations have been made and some studies are still in progress

under the direction of the Corps of Engineers to determine the effect of the spillage of jet fuels and solvents, as well as the effect of the exhaust heat and blast in parking, testing and run-up areas on airfields where large groups of jet aircraft are based. The results of these tests, together with observations by members of the Office of Airports, are summarized as follows:

**Spillage on Bituminous Pavements:** Kerosene, principal ingredient in the jet fuel, JP-1, had the most detrimental effect on the pavements. In accelerated tests using cycles of kerosene saturation and locked wheel turns, the first effect was a softening of the surface to depths of 1/32 to ¼ inch.

Under the scrubbing action of the tires the soft surface material was scraped up into a scum of kerosene, asphalt and fine aggregate. Continued cycles of saturation and turning gradually stripped the asphalt away from the aggregate and in some cases caused the aggregate to tear loose or scour from the pavement.

Other tests conducted under normal operating and servicing conditions, however, indicate, Aaron continued, that such gradual and permanent disintegration does not always occur in fact. For example, tar concrete and tar seals were not adversely affected by the solvents and most of the other surfaces tended to tighten up and regain their original stability when not subjected to continual, concentrated spillage.

It was determined from these tests that a tar seal coat with a suitable cover aggregate offered the greatest protection on existing asphaltic concretes, and that bituminous concrete, using tar, is the most satisfactory type of bituminous pavement for use in areas subjected to the action of solvents and jet fuels. A tar compound called Jennite was also found satisfactory but more expensive.

**Spillage on Portland Cement Concrete:** The only problem here is the effect of the jet fuels on the various types of materials used for sealing the joints; the concrete itself is not affected detrimentally. Asphalts, tars and bituminized latex compounds were used in the concrete parking and run-up areas at March Field, and observations indicate, Aaron said, that the latex compounds give the best performance.

This may be due to the fact that kerosene never truly dissolves rubber even though it may plasticise it. Tests of the suitability of other compounds as joint sealers have not progressed far enough to furnish definite information regarding their performance.

**Effect of Heat and Blast:** Field tests at March Field indicate that temperatures of the order of 375 degrees Fahrenheit or 190 degrees Centigrade can be expected at pavement surfaces in the path of a jet exhaust blast. The maximum temperature condition is obtained when the jet engine is running at approximately 36% throttle and is usually found at a distance of 10 to 20 feet from the exhaust part of the plane.

At 100% throttle, the added thrust forces the plane's fuselage to rise to approximately a level position, thus throw-


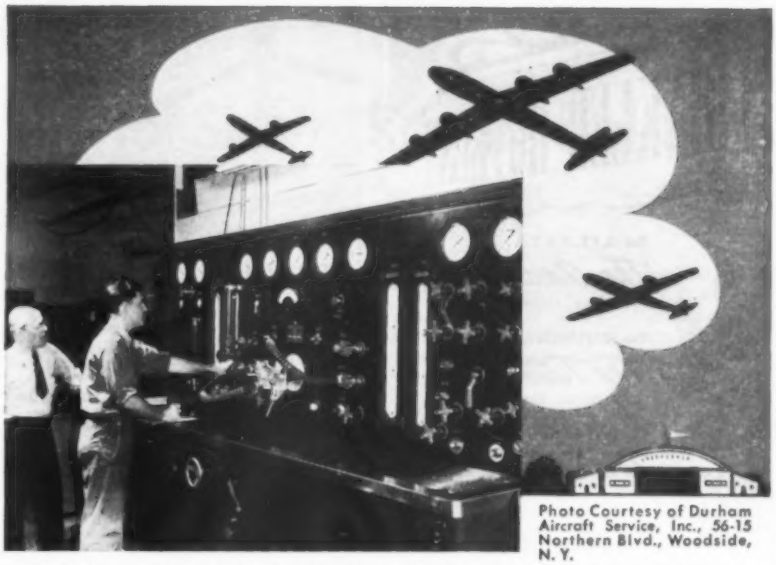

Photo Courtesy of Durham Aircraft Service, Inc., 56-15 Northern Blvd., Woodside, N. Y.

Aircraft fuel pump being tested on Greer Combination Fuel, Vacuum, Hydraulic Pumps and Accessories Test Machine Model FVHPA20-1H. Finger-Tip controls and accurate instruments are used to set up simulated flight conditions and to indicate quickly if pump is faulty or fit for flight. Mr. Kling shown at extreme left supervises test while an assistant records results.

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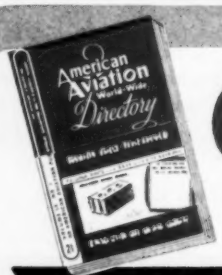


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ing the point of contact out a distance of about 30 feet. At 100% throttle, the critical factor appears to be the combination of heat and the force of the blast.

The temperatures observed are sufficiently hot to develop a state of plasticity in bituminous pavements and this, coupled with the blast is sufficient to cause a disturbance in the conformation of the pavement. Observations of a definite flow and scour pattern in run-up areas indicated that such scour could occur during a long run-up period to such a degree that scouring would affect the full depth of the pavement unless constant and costly maintenance were provided.

The CAA official said, however, that observations to date indicate that the actual damage under normal operating conditions is minor if the seal coat is tight and in good condition. Also, it is evident, he said, that neither the heat nor blast produced by existing jet types have an material effect on concrete pavements.

## CAA Airport Grant Offers

For the four-weeks period ended February 2, the Civil Aeronautics Administration made Federal-aid grant offers totaling $1,168,595 to 40 communities, as follows, with classes in parentheses:

**Alabama:** Pryor Field, Decatur, (3) $92,775.
**Alaska:** Hoonah Seaplane Base, $3,000; Metlakatla Seaplane Base, $3,000; Palmer Airport (2), $94,750; Skagway Municipal (3), $102,250; Tenakee Seaplane Base, $3,000.
**Arizona:** Bagdad Mun. (3), $16,181.
**Arkansas:** Clarksville Mun. (2), $32,417.
**California:** Bishop Mun. (5), $2,491; Santa Rosa (Sonoma County Airport) (4), $4,244; Columbia Airport, Sonora (1), $12,975.
**Colorado:** Alamosa Mun. (3), $4,000; Cortez (Montezuma Co.) (2), $2,650.
**Florida:** Miami International (6), $15,500.
**Georgia:** Atlanta Mun. (4), $31,400.
**Hawaii:** Lihue (3), $227,750.
**Idaho:** Glenns Ferry Airport (2), $2,095; Mackay (1), $1,254.
**Illinois:** Quad City Airport, Moline (4), $90,000.
**Kansas City:** Garden City Mun. (5), $9,650; Salina Mun. (3), $21,250.
**Louisiana:** Alexandria Mun. (6), $8,000; Lake Providence (2), $15,000; New Orleans (Moisant) (6), $142,121.
**Maine:** Waterville (3), $3,812.
**Maryland:** Crisfield Mun. (1), $3,500.
**Massachusetts:** Gardner (1), $10,393; Nantucket (3), $8,488.
**Montana:** Twin Bridges (1), $2,850.
**Nebraska:** Blair Mun. (1), $14,000; Lexington Mun. (3), $1,500.
**New Mexico:** Gallup Mun. (3), $7,500.
**North Carolina:** Wilmington (Bluethenthal Field) (3), $105,000.
**Oklahoma:** Guymon Mun. (1), $2,118; Will Rogers Field, Oklahoma City (4), $1,857.
**Oregon:** Roberts Field, Redmond (5), $22,900.
**Texas:** Fort Worth International (5), $22,500; San Angelo (Mathis Field) (4), $3,603.
**Vermont:** Burlington Mun. (4), $18,750.
**Washington:** Yakima (4), $2,071.

These boosted to 1,162 the total of grant offers made under the Federal Airport Program, and increased the Federal funds involved to $101,719,400.

# Piper 105 Takes to Short, Rough Fields

*By* B. J. WARD

THE WRIGHT Brothers may still hold the record for slow flying at 26 mph but 1950 lightplanes are showing advances towards utility and a wider range of operating speeds.

I went to Lock Haven, Pa., a few days ago and flew Piper's new Super Cub PA-18, model "105," which cruises at 105 mph, stalls below 38 mph, indicated airspeed can haul a useful load of 1-3 of a ton.

The claim that the aircraft is the slowest flying plane in production in the world today, that it will fly at 33 mph, and that it will take off in less space and land shorter than any other certificated aircraft appears justified. In a wind of less than five mph, the plane got off the ground in the width of a 150 ft. taxi strip and landed with a roll of less than 90 ft.

The "105" is an operator's airplane. It has accessory equipment for seeding, dusting and spraying and tandem landing gear for rough field operations. The rear seat can be removed for hauling cargo; it is powered for high altitude landings and takeoffs; and it is pending approval for seaplane operation with floats.

## Good Visibility

Although the fuel consumption is a little high for the purpose, it flies like an old J-3 and could be used as a trainer. Brakes, flaps, good over-the-nose visibility, a mixture control and increased overhead visibility are provided. In a steep turn, the pilot can see what he is turning into by glancing through the "skylight."

This is the most recent of the line of tandem Piper planes which began with the J-3 trainer, the Army L-4 and the PA-11. While its 115-hp Lycoming 108 engine develops more power than is needed for round-the-airport flying, the engine combines with new 40-degree flaps and balance tail surfaces to get the plane up and out of short fields.

Empty weight of the aircraft is 825 lbs. and it is approved for 1,500 lbs. normal weight and 1,400 lbs. utility weight. However, it has been flown with 1000 lbs. of dust in addition to fuel and pilot.

In place of the 40x24x20-inch cargo space a specially designed dual-purpose hopper for dusting and spraying can be installed, having 9½ cubic feet capacity to hold 500 lbs. of lime or 60 gallons of fluid. The hopper can be converted from one purpose to another in an hour and a half, can be hosed out for cleaning in a minimum of time through a bottom opening, and is filled through a hinged "door" in the top of the fuselage.

## Dusting Controls

Dusting controls are simple: an air-driven fan mounted beside the fuselage outside the cockpit operates the dust "mixer" and is locked in position to prevent windmilling when not in use by a brake handle under the instrument panel. A "stick" to the left of the pilot seat is moved to open and close the dust release.

Carrying two persons, the plane climbs over 1,000 fpm or gains 780 fpm fully loaded. Top speed is 115 mph and cruising speed is 105 mph, a long stretch above the listed stalling speed of 38 mph with full flaps and full load. The aircraft has one 18-gallon fuel tank, although an additional 18-gallon tank can be installed for $176. Top fuel consumption is 7 gallons per hour, or 6.2 gallons leaned out, and range is 270 miles.

Power loading is 13.9 lbs. per horsepower and wing loading is 8.4 lbs. per square feet. Selling price of the aircraft is $2,995.

## Model "95"

The "95" model of the Super Cub PA-18 comes without flaps with a lower-powered, more economical, 90-hp Continental engine. Useful load is increased over the "105" to 710 lbs. and the aircraft has 100-mph cruising speed, 624-fpm rate of climb, 44-mph stalling speed fully loaded, and a maximum fuel consumption of 5 gallons per hour with a range of 360 miles.

However, while the "105," fully loaded, is listed as requiring a still-air takeoff run of 575 ft. the "95" requires a 625-ft. takeoff run. It is approved for the same gross weight as the "105" and has the same fuel capacity of 18 gallons. Base price is $2,795.

Two PA-18's and four Pacers per day are coming off the production line at Piper. By June, production will be stepped up to ten aircraft a day, four of which will be PA-18's.

Piper has been running tests on two landing gear designs which offer interesting possibilities of increasing lightplane utility.

## Tandem Gear

A tandem gear which will allow operations on rough ground, is being offered as special equipment on the PA-18. Developed by Art Whitaker of Portland, Ore., the tandem gear consists of two balloon-type wheels on each landing gear. The front

(*Continued on page* 49)

**Tandem Gear**—The new Piper 105 or PA-18, equipped with tandem gear for rough field operations, gets off the ground in six times the length of its fuselage and climbs over 1,000 fpm with one person aboard. Stalling speed is below 38 mph and slow flight characteristics are good, owing to the combination of its 115-hp Lycoming engine, 40-degree flaps and balanced elevator controls. The aircraft has landed in the width of a taxi strip, being braked to a stop in eighty feet.

# For Local Operators

## Tie-Down Equipment

We're beginning to wonder whether tie-down equipment is to hold the airplane down or to peg the ground in place. Two operators, Sam Freeman of Somerset Flying Service, N. J. and Bob Halpin of the Sealand Flying Club at Shelton, Conn., report recent crackups on the ground when tie-down equipment gave in wind storms. Freeman took the train to Washington to and Air Taxi Conference meeting and says next time he'll fly: one of his eager Aeroncas promptly busted a rope in a 50-mph wind, did some maneuvering on its own and ended up with a bashed wing tip.

Halpin has an even sadder story in the *Sealand News*. A windstorm blew one of his planes out of its tie-down ropes, and there went another wing tip. They got the wing repaired and worked two days getting the plane ready for its 100-hour CAA inspection, after which the first customer to fly it knocked the right landing gear off in landing. Halpin writes, "Here's the score. Expense $140. Income $6. Of course it doesn't happen every day on account of the New England weather. We don't fly every day."

Of 100 airplanes damaged in windstorms a study recently made by Jerome Lederer of the Flight Safety Foundation, N. Y. shows that 55% of the accidents were caused by tie-down ropes breaking or stakes pulling out of the ground. About 22% of the planes were completely demolished and 22% required major overhaul, with an average cost per windstorm accident of $557.

Lederer recommends permanent moorings, and careful periodic inspections of the ropes.

## New CAA Malfunction Report

With the publication of a "squawk sheet" CAA has taken a step forward to collect information on which to base safety measures. The new "Malfunctioning and Defects Report, Form 1226," should be filled out whenever a malfunction of aircraft or accessory equipment occurs in private flying. Pilots who have engine failure, radio trouble, malfunctions of fire equipment, etc., should fill out the form, which is a single stamped and addressed sheet with spaces for the desired information. In Washington, the forms will be run through IBM machines to keep a running check on equipment danger points.

AOPA is mailing forms to all their members, A & E mechanics will be furnished with the forms, and all owners of new aircraft will be provided with them. Airport operators might get a stack of the forms from their CAA area office and encourage their use. This could save some lives.

## Flashing Lights

A test stand to try out the various makes of personal aircraft flashing light equipment has been set up at Washington National Airport by Aircraft Owners and Pilots Association. So far, the results look gloomy: the first unit failed in seven hours and the second unit, after varying the rate of flash according to the load on the circuit, failed and took the whole aircraft electrical system with it. More units—probably about six—will be tested under varying conditions of battery charge.

Also, CAA is installing some lightplane flashing light systems on their aircraft at Indianapolis to see how they stand up. CAB will hold off with the proposed Civil Air Regulation 49-8, which would require flashing lights on all planes used for night flying, until all the results are in and it is certain that a reliable flasher system can be procured at low cost.

## Business Aircraft Potential

Any one of the four distributors of automobile accessories and parts in the city of St. Louis has a greater potential business volume than a single distributor of airplane accessories and parts would have if he had the entire United States for his territory.

George W. Jalonick, III, vice president of Southwest Airmotive, Dallas, Texas, gave this illustration of the newness of the aviation industry to students of Arlington (Texas) State College of Aeronautics. Jalonick said that until an airplane can really fit itself into the day to day work habits of the owner, it isn't doing the business a whole lot of good. Farmers and businessmen are finding that the right kind of plane can do the chores: of 89,550 civil aircraft officially registered a year ago, excluding airlines, 40,920 or 36% were engaged in flight by American industry, agriculture and other users *outside* the aviation industry.

Since the end of the war, Southwest Airmotive Company, which caters to service of executive and business aircraft at Love Field, has about quadrupled in size. One month saw 700 executive planes from 34 states on their ramps.

## Elevator Time

If you must travel up and down, a speaker at the recent New York City safety convention recommended that you do it in an elevator. He says it's safest, but we notice he doesn't give any accident statistics.

He brags that the estimated 200,000 elevators in the United States travel about 500,000,000 vertical miles annually, which figures out 2,500 miles on an elevator. We can beat that with a Cub—personal planes average about 3,600 miles a year! These people ought to stop peering up an elevator shaft and go look in the nearest hangar.

This Mr. Edward Dawson of Westinghouse who was doing the talking said that the elevated safety record was the result of "Unending work by city, state and federal government officials, insurance companies, building owners and managers, engineers, architects, and the industry in the preparation and enforcement of safe codes."

Guess conventions are all the same. Not a word about the elevator operator.

✦ ✦ ✦

● **An air show without acrobatics** may be given at Grand Rapids, Mich., next summer by the newly formed Grand Valley Flying Association. A model plane flying contest would be part of the show, which would aim to be purely educational. **Karl Nowak**, an official of the association, says, "Our idea of an air show is to demonstrate the safety factors in flying, to show the public by interesting displays and exhibits just how important aviation is to everyone."

● **The Indiana Aeronautics Commission** has issued small cards giving tower signals and their meanings for in-flight and on-ground aircraft operation. On the back of the card are instructions on acknowledging tower signals, signals indicating instrument flight conditions and right hand traffic pattern signals.

● **Warner Aircraft Corp.**, stockholders have approved a proposal to sell the company's assets to Clinton Machine Co., Clinton, Mich. Warner will be liquidated and Clinton will issue one share of its stock for each two shares of Warner. Clinton stockholders have approved the proposal.

● **About 200 aircraft** from states as far west as Oklahoma and Texas are expected at the Fourth Annual Spring Air Regatta sponsored by the Philadelphia Aviation Country Club on Saturday, May 27, at Wings Field, Ambler, Pa. George T. Pew, Jr., president of the club, says classes will be held for all popular makes of private planes for which there are three or more entries. The cross country competition course of 200 miles will be announced two hours prior to takeoff time.

—B. J. Ward

NEW GEISSE crosswind gear for lightplanes is shown mounted on a Piper Clipper. The gear weighs less than 2 lbs. per wheel and should cost about $15.00 for materials and labor. Gear is castered to "toe out" up to 25 degrees.

wheel is inflated to only 4 lbs. to allow it to climb up and over obstacles which would stop an ordinary gear and the rear wheels have about 8 lbs. pressure and are equipped with brakes.

The gear reduces any nosing-over tendency and has been used on muddy fields, soft sand, and rocky areas.

### Geisse Gear

The other design, test-mounted on a Piper Clipper, is a new light-weight, low-cost, crosswind landing gear developed by John H. Geisse, aviation consultant, and well-known for his lightplane activities while with CAA.

The gear, which weighs about 2 lbs. per wheel and will cost about $15.00 for labor and materials, consists of a spring-loaded hub which rotates with the wheel on an axle. Each of the wheels is allowed to "toe out" up to 25 degrees, but neither wheel can turn inward.

When an aircraft lands crabbed into a crosswind, most of the aircraft weight is on the downwind wheel. Since this gear will "toe out" in line with the path of the aircraft down the runway, there will be no tendency for the upwind wing to come up and create a groundloop. The upwind gear will be unable to turn in line with the aircraft path but, since it takes only a small proportion of the stress, no damage will result.

If accepted by lightplane manufacturers, the gear will have to be CAA type certificated for each type aircraft. Production and royalty problems have yet to be ironed out, but it appears that the Geisse gear may find a widespread application which the goodyear gear, the only crosswind gear in production, has not found due to its cost of about $400.


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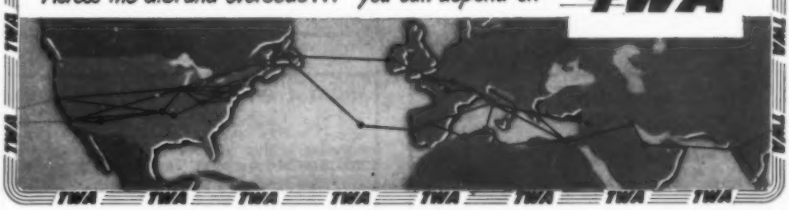

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Box 152 AA5, Whippany, New Jersey

## Brugh Named Hawthorne VP

Kenneth V. Brugh, Jr., has been elected vice president of Hawthorne Flying Service of Charleston, S. C. He has managed the Jacksonville, Fla., base of Hawthorne since its inception in 1946.

Ralph C. Crocker, vice president and manager of the Greensboro-High Point base of Hawthorne, has been elected to the board of directors.

## CAA Specification Changes

**Piper J3L, 2PCLM and J3L, 2PCSM** are authorized for installation of the Hartzell controllable and reversible propeller HC12-20-2 and -3D by Specification No. A-698.

**Cessna 120 and 140** are approved for installation of Federal AWA-1500 Wheel-Ski, Federal drawing 11R395 with the provision that weight and balance of aircraft shall be checked with ski in retracted and extended position, by Specification No. a-768.

**Luscombe 11A** is approved for installation of Hartzell automatic two-position hub model HC-42XF-2, blades model 8433-1, by Specification A-804.

**Cessna C-145 and C-165** are approved for use of Koppers Aeromatic 220/0-85 propeller, by Specification No. A-701.

**Bellanca 14-19** is approved for an auxiliary fuel tank of 25 gallons when installed in accordance with Bellanca drawings 18046 and 18175. Hartzell controllable hub model HC-12x20-8 propeller is authorized. Normal maximum weight has been established at 2,600 lbs. and utility maximum weight is 2,400 lbs., by Specification No. 1A3.

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# WINGS OF YESTERDAY

## 25 Years Ago

On April 11, 1925 Col. Paul Henderson, Second Assistant Postmaster General, issued the regulations covering contracts for carrying the mail by air as authorized in the Kelly Bill. Contractors were required to provide airplane airworthiness and pilot certificates and were permitted to carry passengers and packages, provided the mail received precedence.

•

*Commercial airplane service in Germany, Austria, Switzerland, Denmark, Sweden, Danzig, Latvia, Esthonia and Finland were united in one concern under German leadership when the Europa Union Company was incorporated in Berlin May 9, 1925, with the Junker Air Traffic Company of Berlin as director of operations.*

## 10 Years Ago

(In AMERICAN AVIATION)

Congressional and industry opposition was mounting to President Roosevelt's sudden move on April 11 of submitting to Congress his reorganization plan which would transfer the Civil Aeronautics Authority and the U. S. Weather Bureau to the Department of Congress and abolish the Air Safety Board.

•

*Military and heavy commercial aircraft production in the U. S. had reached a rate of 4,200 in January and was expected to reach 9,600 by September.*

# LETTERS

## Air Transport Progress Issue

To the Editor:

The first Annual Air Transport Progress issue is, without a doubt, the finest aviation publication I have ever seen. The information contained will provide a ready reference that will be used by aviation people throughout the year. Not only are the statistics of interest and great value, but the presentatoin has been beautifully done. Please accept our congratulations.

R. E. McKAUGHAN
President
Trans-Texas Airways

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To the Editor:

Congratulations on your first Air Transport Progress issue. It is fine but I miss the regular cover and hope you go back to it. Your editorial on the front cover of each issue is as much of a habit as reaching into a pocket for cigarettes.

KEITH KAHLE
President
Central Airlines, Inc.
Fort Worth, Texas

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To the Editor:

Your Air Transport Progress issue reminds me quite forcibly that air transportation is really beginning to grow up. It is a good job and I am sure it will be the first of a long and developing series.

C. W. JACOB
American Airlines, Inc.
New York, New York

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To the Editor:

Every once in awhile I am given the opportunity to get up before a group and shoot my mouth off on the subject of the Growth of the Airlines.

Unfortunately, in the past I have usually run out of gas after about five minutes, due to my lack of information. With these remarks as a preface, let me tell you that the April 15th issue of AMERICAN AVIATION is a godsend to fellows like myself and anyone in the industry who desires to know what is happening.

I imagine there are many others who also will save this copy of AMERICAN AVIATION for the purpose of constant reference during the year.

PARKE WRIGHT
National Airlines, Inc.
Washington, D. C.

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To the Editor:

I would like to call your attention to what we feel is a possible error in your April 15, 1950, issue of AMERICAN AVIATION on page 58 under the heading of "Operations-Maintenance" and with specific reference to your recorded data of Airlines' On-Time Record Improvement. Under the schedule of On-Time Operation of U. S. scheduled airlines, we note that Colonial Airlines is listed under Percentage of Route Miles completed for the year 1949 as 100%. We are proud in Continental because CAB statistics have shown that Continental has consistently held the lead for the past three years on scheduled route miles completed for each of above years for domestic scheduled airlines, and the CAB yearly statement for 1949 shows Colonial as completing 97.22% of the scheduled route miles. For that reason, we are calling this matter to your attention, thinking it possible we might have been in error in our statement.. However, rechecking the CAB yearly statistics for domestic airlines, we find it shows that we were on top. We are merely calling this matter to your attention, as there possibly could be an error in CAB statistics, thereby making our statement an error.

O. R. HAUETER
Vice President in Charge of Operations
Continental Air Lines, Inc.

*(Editor's note: The 100% figure in the table was obtained from Colonial, which following a different practice than other airlines, includes extra section mileage in its "route mileage completed." For this reason, Colonial's figure is sometimes greater than 100%. The extra section mileage is not included in the CAB figure of 97.22, which would be comparable with the other airlines.)*

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To the Editor:

Just a short note to inform you that Trans-Texas Airways' aircraft direct operating costs, shown on page 75 of your Air Transport Progress Issue, are listed too high for DC-4s.

STANTON B. DANILOW
Public Relations Director
Trans-Texas Airways

*(Editors' Note: Sorry, but the figure for DC-4s shown for Trans-Texas, which operates DC-3s only, belong to Pan American.)*

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To the Editor:

There is absolutely no question in my mind but that your April 15 issue is one of the most valuable editorial contributions ever made to air transportation.

You are deserving of the highest commendation and while I will not be the first nor the last to so express themselves, none could be more sincere than my own.

In my own limited experience down through the years, I have had the opportunity to work on and produce special edition projects—but I do not think that these or others that I have observed possessed the quality of this one which you have done. It is indeed a great and notable service this issue has rendered and I am sure that most will agree that it is to the credit of the industry and those who represent it in the field of publications.

DICK BROWN
Jordan,Brown, Advertising
New York, N. Y.

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To the Editor:

My hat's off to you and your staff on your memorable, well-packaged Air Transport Progress issue. You certainly have done as interesting and complete a job of telling the story of American Air Transport in facts and figures as I've ever seen.

MARK E. NEVILS
Forest Hills, L. I., N. Y.

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## Cosmic Kidoodle

To the Editor:

Your issue of March 15 greatly takes my eye. You personally took apart the flapdoodle generated by the Aviation Education Conference in a manner reminiscent of my old friend C. G. Grey of The Aeroplane in England in the palmy days when Cy Caldwell used to crack back at him. But I'm sure you did not take such liberties with facts as Grey did.

Anyway, it seems to me high time that we who have struggled with this flying business woke up to the fact that it just isn't going to develop into a volume affair along automotive lines and that it is absurd for the CAA to whip up gobbledegook conferences of the nature you described so tellingly.

HENRY J. WHITE
Baltimore, Md.

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To the Editor:

Just read your article published March 15, "The Cosmic Kidoodle." Can't resist a big vote in your favor.

It is one of the finest commentaries I have read on the futility of gab. Everyone in the industry should read that one! It would be a fine thing if it could be distributed to every high school and junior college in the country. We thank you.

DeWITT MEREDITH
The University of
Southern California
College of Aeronautics
Santa Maria, Calif.

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To the Editor:

I've read with much interest your editorial "The Cosmic Kidoodle," in the March 15 issue of AMERICAN AVIATION. I admire your courage for sticking your neck out in this editorial after attending the Aviation Educational Conference at Atlantic City. I am confident that you have helped many of us to clarify our thinking on the subject.

I am of the opinion that the text books in our public schools should include at least a preliminary, informative aviation educational program which should not add too great expense to the tax payer. I believe that the industry should carry its own burden and stand upon its own feet just like the automobile, radio and television does. I believe that our airlines have arrived at a time when they too should be self-supporting just as our railroads, steamship lines, telephones and other public utilities.

EVERETT J. WOOD, President
Skytours, Inc.
Swarthmore, Pa.

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## Airline Safety Men

To the Editor:

It was refreshing to see your April 1 cover featuring Mr. Robert Fulton. There's only one factor of safety in air operations I know of—keep 'em in the air until you get ready to land. The maintenance mechanics are the ones who do that job. Did you

ever before run a cover photo of a guy without a necktie? I'd like to see another.

ROGERS HUMPHREYS
St. Thomas, Virgin Islands

*(Editors' Note: the answer to former airline executive Humphreys is "no." But we concur wholeheartedly about the importance of the mechanic in safety.)*

## Airport Courtesy

To the Editor:

I have read with a great deal of interest your campaign for better facilities and more courtesy at airports. You might be interested in a rather bitter experience I have just had at La Guardia Field.

First of all I would like to say that I had polio last fall and am able to get around with the help of a brace on one leg and another around my abdomen. Fortunately, I can drive a car.

This happened on April 12 around 4:30 p. m. I was going to meet a friend who was coming to this country for the first time (there was no one else in this country that she knew) so I wanted to drive into the area where the Carey busses go. A policeman stopped me and told me I couldn't go in. I explained my disability to him and he told me I could have had someone else meet the passenger.

I tried a different entrance and was advised that I could get a pass from the taxi starter. This individual advised me most unpleasantly to go park the car, let a red cap bring the baggage out and let the passenger walk to the car, an obvious impossibility.

Finally I got to a parking lot where the attendant said I could stay for 20 minutes free of charge. If I was going to be more than 20 minutes I should come back and get the free time renewed for another 20 minutes.

It took me almost 10 minutes to walk from the car to the place where I could meet the passenger. Fouled up as I am it would be silly for me to keep walking back and forth just to renew a parking ticket.

Now the nice thing about this free parking allowance is that if you are parked for 21 minutes the fee is 50c. If you go in the regular parking area the fee is 25c for the first 4 or 6 hours.

This whole performance certainly left a bad taste in my mouth. If this sort of thing is common and I have been assured that it is, it is certainy doing aviation a lot of harm.

The discourtesy that was shown by the people I talked to was unbelievable. They assumed the attitude that I was a liar and that I was wearing the braces as a gag. They further indicated that they didn't care a continental whether I tired myself, injured myself, or jumped into the bay.

The Port Authority should certainly check some of these things and cerrect the abuses but then they are just as bad as the little Caesars that I spoke to except that they are a little bigger.

Keep punching away to correct the abuses at airports. Maybe some day the people will wake up.

W. G. GILMORE
Port Washington, N. Y.

## Hydrant Fueling

To the Editor:

In your issue of April 1, you have an article on page 45 under the heading "Airport News Digest." We quote this article in its entirety:

"The new hydrant refueling system at Wheeling-Ohio County (W. Va.) Airport is attracting wide interest. Said to be the first complete installation of its type, the system consists of four conveniently located fueling stations housing two hydrants each. The stations are flush with the apron, near the normal parking position of aircraft. A specially designed hosecart that can be attached to the nearest hydrant refuels aircraft with minimum time and effort, eliminates the need for tank trucks or tenders, reduces airport costs and minimizes accident hazards."

The hydrant type of refueling has been in effect for some time prior to the Wheeling installation. Moisant Airport, New Orleans, as well as Gander Airport, Newfoundland, have hydrant systems in operation for well over two years. A similar installation has been used at the new international airport at Tocumen, Panama, for the past year.

Again, a similar installation has been in operation at Keflavik Airport, Iceland. Many other installations have been in operation in the Far East for a longer period, and we feel that the article mentioned above does not present an accurate picture.

ANDREW D. LEWIS
Esso Export Corporation
New York, N. Y.

*(Editors' Note: Mr. Lewis is right. Claims of "first" in anything are usually risky, and this one should have been caught. Our face is redder than usual, since American Aviation for June 1, 1949, contained a feature on hydrant-type refueling, based on a paper presented by Bob Oertel of Esso Standard Oil at the annual meeting of the Airport Operators Council.)*

## Ryan's Firebird

To the Editor:

Some time back I was going to take issue with you on the statement, as I recall, both in the *Daily* and in the magazine, that the Navy's recent announcement of its "Mighty Mouse" air-to-air rocket missile appeared to write off the Firebird.

Until I saw some recent information, I wasn't certain whether or not the "Mighty Mouse" was a guided missile or aimed by the airplane's direction of flight. Since the latest release I've seen makes it clear that the airplane must be aimed at a target, it's obviously unfair to compare it with the Firebird as an example of a guided missile.

No doubt the "Mighty Mouse" is extremely effective for its type, but it certainly doesn't take the place, nor write off, guided missile development.

WILLIAM WAGNER
Public Relations Manager
Ryan Aeronautical Company
San Diego, Calif.

*(Editors' Note: American Aviation intended no slight to the Ryan Firebird, a target-seeking missile certainly not to be compared to the Mouse. We were trying to point out that the Navy had been somewhat overenthusiastic in terming the Mighty Mouse "the first successful air-to-air missile," since the Firebird, which had been fired earlier, had been quite successful.)*

## Sky-Tel Interest

To the Editor:

May we take this opportunity to extend our sincere thanks and appreciation for the recent article on our operations and Sky-Tel.

I might add the publicity has created interest in the aviation industry and aircraft owners to learn about such facilities available.

FRANK S. PITTENGER
Stewart Aviation Company
Parkersburg, W. Va.

## Likes En Route

To the Editor:

Your *En Route* page is by far the most interesting thing I have read in a long time. I seem to become so absorbed while reading it that I actually imagine I am making the flights myself.

GEORGE F. ALDERMAN
Lake City, Fla.

## Saucer Traffic Control

To the Editor:

I've been reading so much lately about these "flying saucers," "space ships" and other itinerant space-craft making unauthorized flights around your skies that I've decided some firm measures should be taken to control these fellows. This especially seems necessary when I read a glowing report about one of the machines crashing in Mexico and a small green fellow with a square head (the description could fit any one of a number of aviation executives) peered out from under the wreckage at a peon and his burro who reported this discovery the next day from Los Angeles. No explanation was given as to how the two of them arrived in Los Angeles in shortly more than airline schedule time. The above, of course, could be a garbled account of what actually happened—sometimes the wire services down this way wander a bit.

Personally, I believe these things exist—I think somebody is cruising around our planet looking us over wondering what strange animals we are. I feel very strongly, however, about their unauthorized flights. If they are going to cruise in our skies they've got to conform. Insofar as I am a member of an international organization concerned with international air regulations, I would appreciate your advising these "operators," through some medium that I'm sure you will devise, that: they must subscribe to the thesis that air traffic should be conducted at specified altitudes providing safe clearance between aircraft proceeding on opposite or intersecting courses; that the present quadrantal requirements do apply to all itinerant spaceships, and that traffic patterns around airports will be heeded.

C. J. TIPPETT
Representative
South American Office, ICAO
Lima, Peru

# IN FLIGHT

## A PAGE FOR ALL PILOTS

### Quick-Reference Check List

IN A RECENT Flight Safety Foundation bulletin **Jerry Lederer** notes an interesting development in the line of pilot check lists. It appears that one group of airline pilots is using telephone memory-ticklers for emergency check lists. These are the desk-type address holders housed in a simple metal container with a spring top. The letters of the alphabet are along one side. Placing an arrow opposite the appropriate letter and pressing the button opens the holder to the indexed page. The pilots are using each page for a particular check such as engine overspeeding, propeller feathering, emergency descent, etc. These titles are pasted on the metal cover plate in place of the alphabet thus making a ready reference check list for any given emergency.

### GCA and ILS

*The controversy over the relative merits of GCA and other approach aids is tending more and more to be sidetracked by the policy question of whether pilots should allow controls to be taken over by people on the ground. We tend to forget that for years Naval pilots have learned to trust implicitly the instructions of a man on the ground not only throughout the approach but in deciding when to cut power for the touch-down.*

*We remember thinking during the war how preposterous it was that we should entrust our landing to some unknown below who may not even be a pilot—let alone possess experience of the particular model being decklanded. But later, when the team spirit grew, it was the most natural thing in the world to follow those friendly and compelling arm signals. We knew, too, that if something went wrong the broken nose was ours but the fault was his.*

*So airline pilots should judge the different approach systems on their own merits and any question of the so-called decline in pilots' responsibility is of secondary importance when set beside the matter of public safety.*

### Panagra Pioneer

The first of Pan American-Grace's pilots to complete twenty years with the company, **Captain Thomas F. Jardine** was awarded his 20-year pin recently. Since joining Panagra in 1930 he has flown over 3,000,000 miles and accumulated over 16,700 hours flying time. Jardine was the first man to complete the trip from Cristobal, Canal Zone, to Lima, Peru, in one day when he ferried the first Douglas DC-2 over the route averaging 175 mph. He is responsible for pioneering many of the present day U. S. airline routes along the west coast of South America. Jardine now flys the Miami-Buenos Aires route on regular schedule.

Jardine

### Captain on the Right?

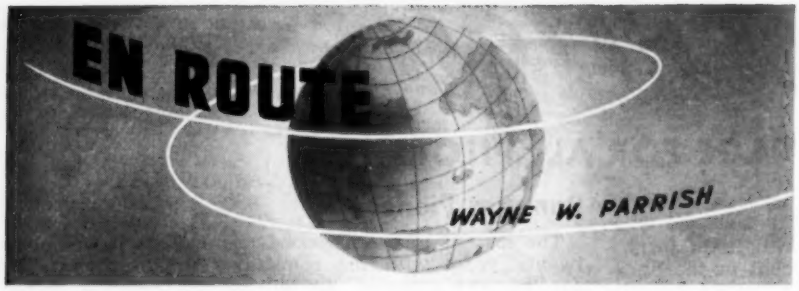
*In the cockpit standardization panels now studying the problems of standardization among the various branches of the military services, the panel members have argeed on the right side of the cockpit as the pilot's position. Civil agencies are adopting some of the panel's recommendations and consequently such decisions on the part of the military services is apt to determine civil practice in the long run.*

### Transonic Flying Over Los Angeles

Flying at high mach numbers over L. A. causes one perplexing problem. The famous smog which hovers over the city until it filters away past Beverly Hills into the San Fernando Valley is held there by a temperature inversion. It is not actually hotter at 10,000 feet than it is at grand level but it is hotter than normal. So, if you reach a true air speed of say 607 mph this, normally, would be over mach .85. But here it's less because the rise in temperature causes the sonic wall to recede. So what the true mach number would be is anyone's guess without an air temperature gauge.

### Comet Cockpit

This de Havilland photograph reveals much new technical information for the first time. The Machmeter shows that evidently slight local compressibility starts at .7 and continues up to .8 which is the limiting Mach number. A notice in the aircraft restricts the speed to 300 knots I.A.S. Taking these two limitations together it is clear that from 20,000 feet to 40,000 the aircraft can reach its cruising speed of about 485 mph. The fuel gauges on the right panel appear to indicate that the fuel capacity adds up to about 8,100 gallons. The standard British flight instrument panel has not been fitted and there is no visible provision for ILS although there is space available. The flap quadrant shows that the take-off gate is at 20 degrees and the maximum angle of depression is 60 degrees.




**Spain-ah!** When our TWA press flight landed at Madrid in February I had a feeling of great exhilaration. I like Spain. I like the Spanish people. Probably the most enjoyable five weeks in my life were spent 20 years ago rambling over Spain and Portugal on wooden seats in third class rail coaches, reveling in the fabulous cathedrals, wandering through walled hill towns and breathing in the atmosphere of one of the most colorful and interesting countries on this globe.

I get a thrill out of the scenery of Norway and Switzerland, of the bustle of London and the fun of Paris and the other-world atmosphere of the Middle East. But for the kind of vacation built on appreciation of architecture, art and history, give me Spain. Spain is the art treasury of the world. Spain has everything from the finest Gothic and Romanesque to the ancient Roman and the Moorish. Name it, and Spain has it.

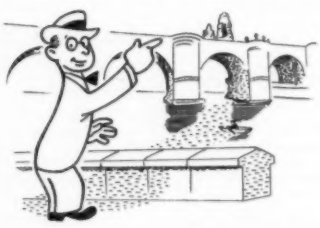
Bear with me for a few issues and I'll prove it. Travel with me in Spain and I'll whet your appetite to go there and see for yourself. You haven't known much about Spain because it hasn't been on the "grand tours." It has yet to be "opened up" to the average tourist. There are reasons for that which I'll explain in due course. But if I had my choice for a month's vacation with a car in all this world, it would be Spain.

I can be sure of this now. Before setting down in Madrid in February I had wondered whether my memories of 1930 had played a trick on me, whether Spain was really as wonderful as I had thought as a student just out of college I was in Madrid in 1945, but Madrid isn't the real Spain, it's a relatively modern capital as cosmopolitan as most other capitals of Europe. But in February I drove south of Madrid to Toledo to see if the beauty and charm of the Spain I had remembered was still there. It was. Now I'm sure. Spain has more of the best than any country in Europe.

✣ ✣ ✣

**You'll Like It—if.** If you're looking for gayety, night clubs, the kind of frivolous vacation where you don't have to think, the kind of bird-brain tourism which makes Europeans think Americans are simple-minded nuts, don't go to Spain. You'll find it dull. Don't go to Spain, either, if you want a recreational vacation with bathing, fishing, hunting and the like. But if you want to deepen and broaden your life, Spain will enrich your mind just as fine music does. Spain will give you just as much as you want to get out of it. The pleasure of Spain isn't delivered to you in an easy chair. You have to meet it half-way. You may even have to do some reading. But give me Spain for a change of pace. I like it. And you will, too, if you have any adventure left in your tired bones.

*. . . Baedecker's ageless tourist book*



*. . . Roman aqueduct at Segovia*

Let's go back to February of 1930. I was in Europe on a Pulitzer traveling scholarship and trying to make a few bucks go a long way. In Paris I found that I could buy a 3rd class mileage ticket on the Spanish railroads, enough to cover the whole country, for about $26.00. This was a travel bargain worth the name. My five week's trip from Paris back to Paris, including Portugal and Spanish Morocco, and living quite well all considered, came to $105. That can't be matched today by a wide margin.

My guide for Spain in 1930 was the most recent edition of Baedecker's published in 1913 just prior to World War I. I 'borrowed' it from the American library in Paris. It was just as up to date as though it had been issued in 1929. The pictures it described as hanging on the south wall of Room 14 of the Prado Museum in Madrid were still hanging in the identical places. The rail schedules and times, trolley and bus services, hotels, and just about everything else, were virtually unchanged in 1930, 17 years after the guidebook had been issued. The same 1913 guide, the last good guidebook ever made of Spain, will serve your purpose quite well today. That's Spain. Nothing much changes.

✣ ✣ ✣

**Bleak.** I had two early impressions of Spain. One was the arid and bleak character of most of the country. It is very dry. The soil is hard and it produces little. Only in the far northwest and on the northeast coast is there any lush growth. The second impression was that Spain is quite dirty outside of the main cities, according to our standards. Every corner of a building, including the churches, seems to be a urinal. I happen to be one of those who thinks that normal body functions are something to be taken care of (1) in privacy and (2) with modern conveniences. But the hillsides serve instead of modern conveniences in poverty-ridden Spain, so the traveler who really wants to see out-of-the-way places in Spain has to get accustomed to life-as-she-is-lived in Spain. And this life can often be on the primitive side—outside of the major cities, of course. The latter are as modern and as clean as they come anywhere else, although somewhat run down in recent years.

Spain is about four-fifths the size of Texas or a little larger than Ohio, Indiana and Illinois combined. But it has over 28,000,000 population and two cities of over a million—Madrid with 1,300,000 and Barcelona with 1,200,000. Twenty years ago it was necessary to travel by rail, quite slow, but today the rail service is next to impossible because of the shortage of coal and run-down equipment. But the highways are reasonably good.

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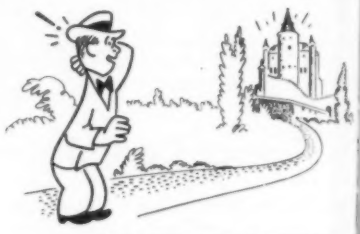
**Moors From Africa.** So slow has been Spain to change that the country is a living guidepost to the past. Two thousand years ago it was invaded by the Romans who left many marks of six centuries of occupation, the aqueduct at Segovia being the most notable. The Visigoths (Germans) from the north pushed out the Romans. By the year 713 the Arabs or Moors came from Africa to take over almost complete control until finally, in 1492, the year America was discovered, Ferdinand and Isabella succeeded in shoving the Moors back across to Africa. The Moorish influence is seen everywhere in southern Spain, especially in the beautiful Alhambra at Granada and the mosque at Cordova which is now a cathedral.



*. . . the beautiful Alhambra*

The Spanish themselves seemed to have originated little in the way of art but they did bring to Spain by one means or another the best artisans and art of the times. The cathedrals, the stained glass, the elaborate tombs, the altars, cloisters, paintings and reliefs and the castles, all reflect imported ideas and skills. Gold from the new world played its part, too—the cathedrals are fabulously rich even today with the treasures from the past. Thus Spain is a storehouse of wares from other countries. You can see the art of Europe in the Iberian peninsula. It's all there as it has been for centuries.

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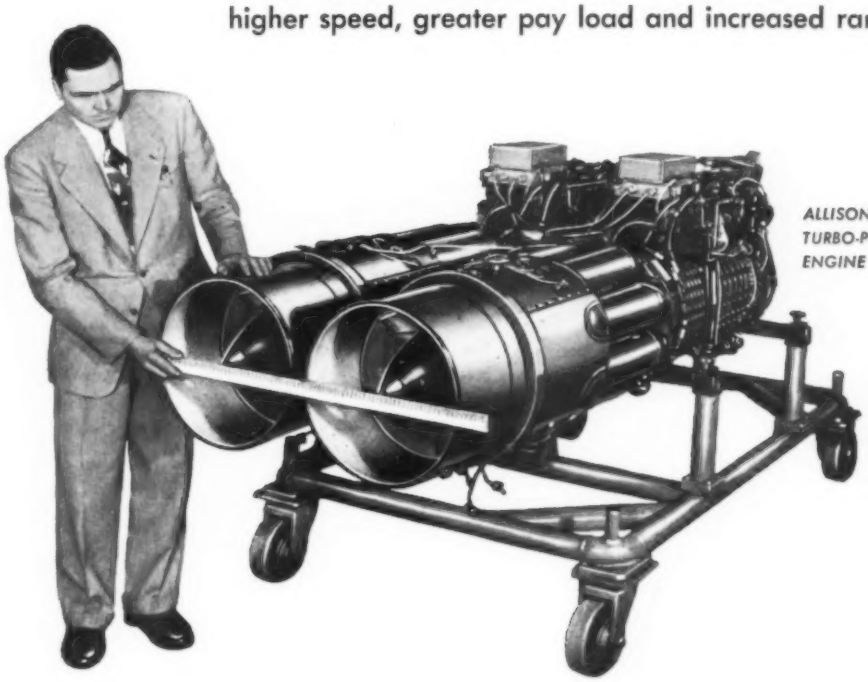

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